Contents May 1919

MOTOR BOATING

Vol. XXIII No. 5

EDITED BY CHARLES F. CHAPMAN

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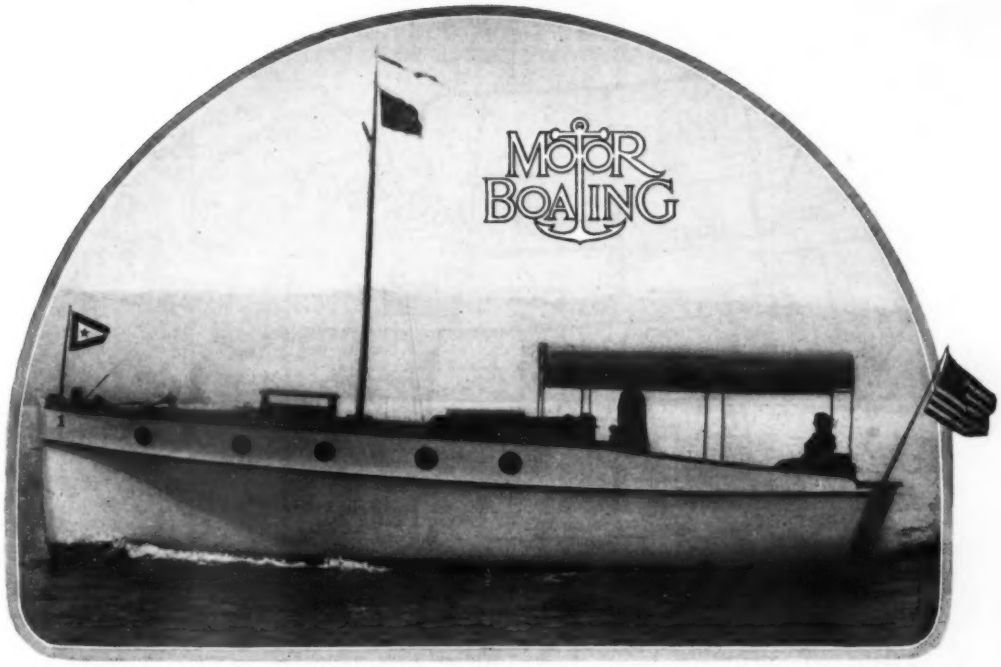


Farad, owned by the editor of MoToR BoatinG, and assigned No. 1 by the Commissioner of Navigation. Note the number on the port bow

To Use Your Boat This Summer

Get Your Number, Pay Your Tax, Carry the Required Government Equipment and Then—Go Where You Please, Whenever You Please, and as You Please

By Charles F. Chapman

THE lid is off.

How different motor boating will be this summer from what it was a year ago! There will be no more war regulations to be complied with, no more Navy Department licenses to be obtained, no more restricted zones, no more reporting to this or that patrol boat every few minutes during one's cruise, no requirement that we get to our mooring before sun-down or obtain special permission each time we desire to go to our favorite fishing grounds, no more gasless Sundays or the consequent going out of commission weeks and weeks earlier than formerly and no more of the many other restrictions which necessarily had to be in force during the period when our nation was at war.

For the coming season, and for all times it is hoped, there will be no limitations whatsoever on the use of motor boats on the Federal waterways of the country. It is true that since last year legislation has been enacted by Congress which requires all boats to carry a small number on each bow but the means of obtaining this number has been made so easy and the fact that there is no charge for the number and that the number never has to be renewed should not work the slightest hardship on anyone.

In addition to the number, it will be necessary for every

DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION
WASHINGTON

No. _____ (Do not write in this space.)

Name of owner .....

Address..... (Street and number.) (City and State.)

Name of vessel ..... Type of vessel .....

Length over all ..... ft.; beam ..... ft. Horsepower of engine.....

Principal occupation of vessel .....

I certify that the above statements are true and hereby make application for a number for the vessel described.

Date ..... (Signature)..... (Owner.—Master.)

11—6389

DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION
WASHINGTON

Name of owner:

No. DO NOT WRITE IN THIS SPACE

Address: (STREET AND NUMBER) (CITY AND STATE)

Name of vessel: | Type of vessel:

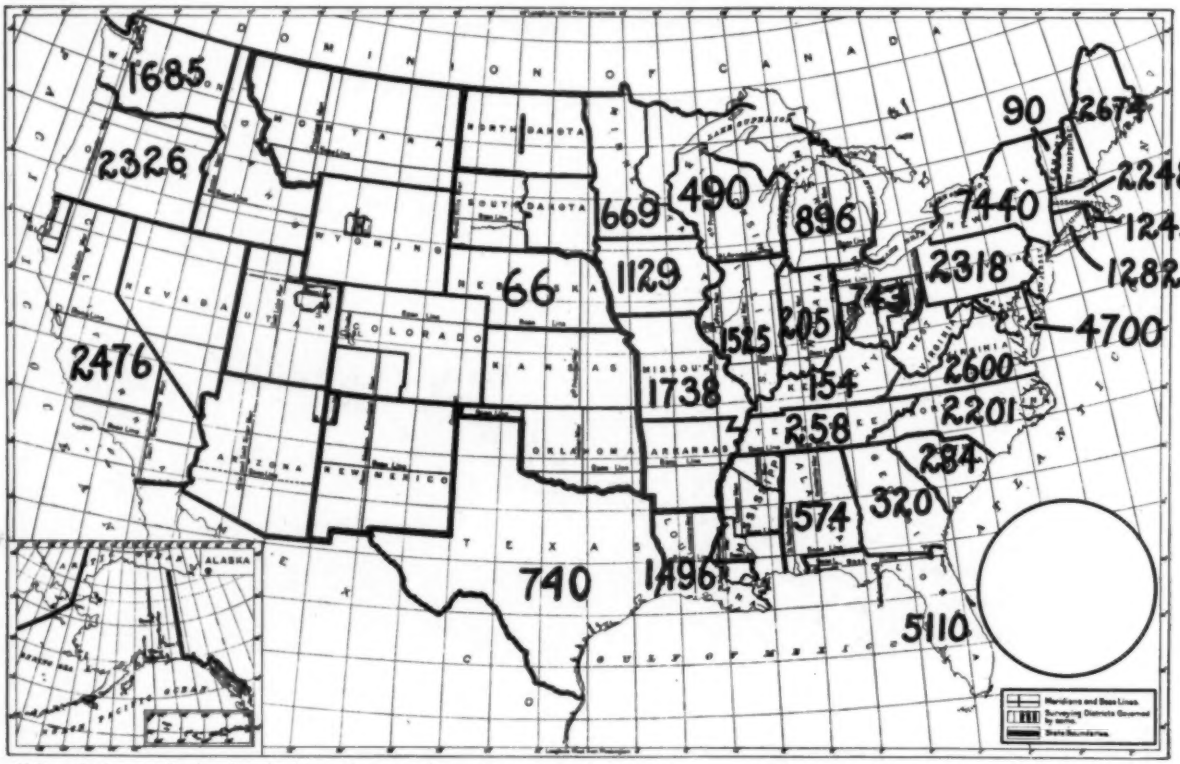
Length over all: ft.; Beam: ft. | Horsepower of engine:

Principal occupation of vessel:

I certify that the above statements are true, and hereby make application for a number for the vessel described.

Date: ..... (Signature) .....
11—6389 *Owner—Master*

The two cards which will be sent to the motor boat owner when he applies for his number and must be filled out by him. Instructions for filling out card: 1—Write clearly and legibly. 2—Indicate whether the person signing is owner or master by crossing out the word which is not applicable. 3—If vessel has no name, say "None." 4—Type of vessel—state, for example, whether raised deck, cabin trunk, auxiliary houseboat, open, etc. 5—To determine the length, measure from end to end over the deck, excluding sheer (i.e., have the line taut). 6—Principal occupation of vessel—state for what purpose the vessel is principally used, as for example, pleasure, oystering, fishing, carrying passengers for hire, transporting merchandise, etc. Send this card filled out, to the Collector of Customs, in whose district the vessel is owned



Although the numbering law had been in operation only two months (and these were winter months) yet nearly 50,000 motor boats had been numbered in this time by the Collectors of Customs. The figures on this chart shows the number of boats numbered in the various states up to the middle of February

motor boatman before he uses his boat this summer to pay the Federal excise war tax which is imposed for the use of his boat. While we all admit that this tax is more or less of a hold-up and rather exorbitant in its size, yet it is one of the rewards of Victory and must be paid by all. It is quite probable that if the proper organized effort is made on the next Congress which is about to assemble, the tax on the use of motor boats can be removed altogether if not greatly reduced.

The third requirement which a motor boatman must look to is that the necessary life saving equipment required by the Government is on board his craft all the time she is underway. However, these requirements are no different from what they have been in the past and therefore will not require further attention if your boat has been properly equipped in the past.

The most important of the three requirements mentioned is probably that of numbering. As most motor boatmen will remember, this new law went into effect December 7 last and requires that all motor boats, both ashore and afloat, must carry a number at least three inches high on each bow, the number to be assigned to the owner by the Collector of Customs in the district in which the owner lives.

In order to obtain one's number it is necessary for one to either call upon the Collector of Customs of his district or make application by mail for a number for his boat. The Collector will then send to the owner two blank cards similar to those illustrated on page 7, to be filled out by the owner and returned by him to the Collector of Customs. By referring to the reproductions of the cards shown on page 7, it will be seen that the only difference in the cards is that one is prepared so that it can be filed numerically, while

Cat. No. 1215

AWARD OF NUMBER TO UNDOCUMENTED MOTOR VESSEL

DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION

C. F. Chapman,
119 West 40th Street
N. Y. City

Office of the Collector of Customs,
Port of NEW YORK, N. Y.
JAN 25 1919, 19....

Sir:

In compliance with your application, number 1 is hereby awarded your power vessel, Farad

This number must be painted on or firmly attached to each bow of the vessel, in such manner and color as to be distinctly visible and legible, and must be not less in size than 3 inches high and of proportionate width. They must be of the Arabic style and the letter of the block or Gothic type. For example:

A 35

Inclosed is a copy of the law requiring these numbers and also Department Circular No. 236, showing the equipment you must carry on your boat when she is being navigated. Failure to comply with either of these laws will involve the penalty provided.

Respectfully,

BYRON R. NEWTON
Collector.

2 inclosures.

A copy of the letter you will receive from the Collector of Customs

the other card will be filed according to the name of the owner. On each card are lines for the name and address of the owner, type of boat, that is, whether the craft to be numbered is of the raised deck, cabin, trunk, houseboat or open type, a place for the length and beam of the boat, the horsepower of its engine and the particular occupation of the vessel, that is, whether it is used for pleasure purposes, oystering, fishing, carrying passengers for hire, etc.

After the owner has returned his two cards to the Collector of Customs by mail or otherwise, the Collector will assign a number to the boat and owner applying for it in conformity with a system adopted by the Bureau of Navigation of the Department of Commerce to distinguish between the various Customs districts. In other words, not only will the owner and boat be assigned a number but with the exception of the New York District a letter will also be assigned which must be used with the number. This is done also to keep down the size of the numbers so that the largest number will not contain more than four figures in addition to the particular letter. The letters will, in some cases, prefix the number and in other instances will follow the figures. The table printed on page 64 shows the letters assigned to each Customs district.

The Collector of Customs will notify each owner of the number assigned to him. The reproduction of letters of notification to the writer assigning him No. 1 is shown on page 8.

Of course, it is a fact that the number of cities and towns where there is a Collector of Customs is rather limited. A list of the principal places where the Collectors of Customs have offices and where it is proper to apply for your number is shown on page 64.

If the motor boat owner receives notification of the number assigned to him, he must either paint these numbers on the bow of this boat or attach metal or wooden numbers thereon. No special type or form of number is specified, the only provision being that they are easily distinguished and are at least 3 inches high.

Certain classes of motor boats are exempt from the provisions of the numbering bill and these include (a) vessels registered, en-

(*Continued on page* 60)

EQUIPMENT REQUIRED BY LAW TO BE CARRIED BY EVERY MOTOR BOAT WHILE UNDER WAY

Class I—Boats Under 25 Feet, L. O. A.

Lights—Combination red and green lantern (or bow and colored side lights) and stern light.

Sound Apparatus—Whistle capable of producing blast prolonged for at least two seconds.

Class II—Boats 26-40 Feet, L. O. A.

Lights—White forward light (lens at 19 square inches); white stern light; green starboard light; red port (lenses at least 16 square inches); screens at least 18 inches long; lenses, fresnel or fluted glass.

Sound Apparatus—Same as Class I, plus fog horn and bell.

Class III—Boats 40-65 Feet, L. O. A.

Lights—Forward light with lens at least 31 square inches; white stern light; green starboard light; red port light (lenses at least 25 square inches); screens at least 24 inches long; lenses, fresnel or fluted glass.

Sound Apparatus—Same as Class II, except bell must be at least 8 inches across mouth.

All Classes.

One life preserver for each person on board. Life preservers, life belts, buoyant cushions, ring buoys, or similar devices in sufficient number for every person on board, and placed so as to be readily accessible. Life preservers or buoyant cushions must be capable of keeping afloat for twenty-four hours a weight exerting a direct downward pull of twenty pounds, on boats not carrying passengers for hire. No pneumatic life saving appliances, or appliances filled with granulated cork will be permitted. Planks, grating, etc., or small boats in tow cannot be substituted for required life saving appliances. Floats of seasoned wood, not exceeding white pine in weight, and measuring at least 4 feet by 14 inches by 2 inches, may be used.

(See page 35.)

A fire extinguisher capable of extinguishing gasoline fires.

At anchor, a white light only, less than 20 feet above the hull, visible around horizon for at least one mile.

Two copies of the Pilot Rules must be carried on board.

On the right: the Hon. A. J. Tyrer, Deputy Commissioner of Navigation, friend of the motor boatmen and father of the numbering law. Mr. Tyrer is here seen making an inspection trip on the Potomac aboard Commodore Bennett's cruiser Aragon. The Commodore is at the reader's left

Why Should I Own a Motor Boat?

No Other Recreation Offers Such a Complete Change as Does Motor Boating — Set the Motor Humming and the Limitless Vistas of the Waterways of the World Lie Before You

By Stillman Taylor

IF you ask the first motor boatman you may chance to meet the reason why he likes to spend his spare time on the water and take his recreation behind the wheel of a motor driven craft, he will very likely tell you that the sport appeals to him because it is a pleasant change from every-day life upon shore; that it is a clean sport that takes him away from the hot and dusty throughfares out into the sunny, wind-swept open where there is always a cool breeze blowing and where there is found neither noise nor a crowd to interfere. And if you ask him further what kind of motor boating he may happen to prefer, he will mention but one of many enjoyable phases of this really great and exhilarating sport, as he happens to own a well-known speed boat, a natty little runabout, a comfortable cabin cruiser, or perhaps a luxurious motor yacht as completely furnished as the bungalow on shore.

And from this you may infer that the sport of motor boating is a recreation replete with much interesting variety. It is, and while many who are not very familiar with boats may suppose that a boat is a boat and boating just a sport like tennis or golf, those who are familiar with the water will inform you that boating, and motor boating in particular, can boast a much greater variety than the majority of recreations. Every sport which takes us out into the fresh air has gained a certain degree of popularity but many are enjoyed by but a comparative few, for some, like tennis, are too strenuous for elderly people, while others, such as golf, cannot be enjoyed by us who live remote from clubs.

There are just three important recreations which may be grouped under the one caption of universal sports and these are shooting, fishing, and motor boating. All three are enjoyed around the world and are closely allied because the motor boat is so much used by sportsmen as a handy way of traveling to the best shooting regions and there is, of course, no more convenient way of reaching the best fishing grounds of river, lake or sea than by the quick and dependable motor boat.

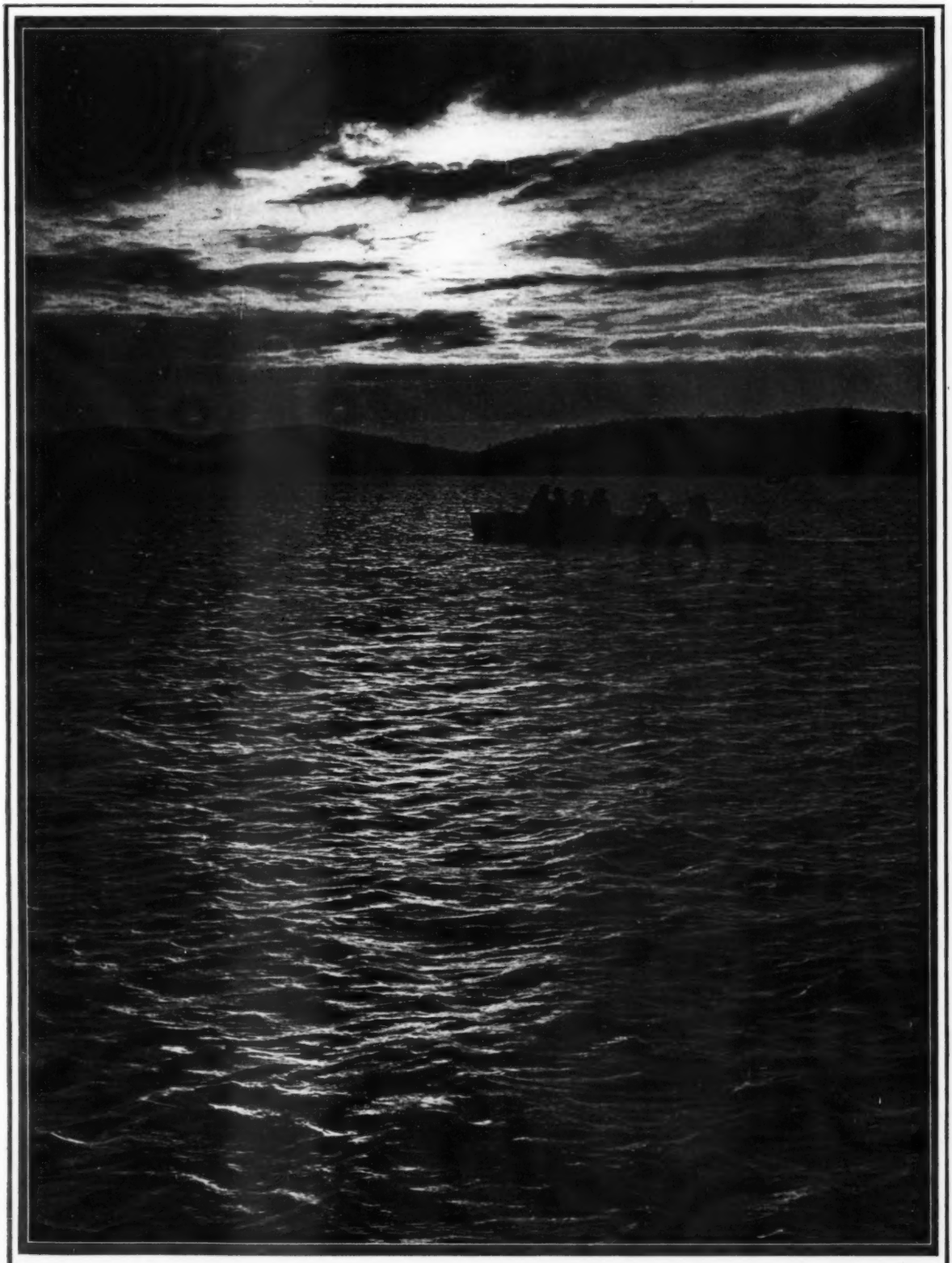
Yes, there is plenty of variety in the sport of motor boating and the only qualification necessary to thoroughly enjoy it is a stretch of navigable water. I have met many enthusiastic motor boatmen, some are regular motor boat bugs and the sport is their one great recreation and absorbing hobby. A few are big business men who own expensive motor yachts manned by a professional crew, but the great majority are men who own small and medium-priced craft and it is these men who man their own boats and who are actively interested in the sport for the healthful pleasure they glean from it, that has as easily boosted motor boating as a popular pastime until it now occupies an important place in the trio of universal out-door sports. If a man likes the water and lives within reasonable distance of lake, sea or river, there is no reason why he cannot enjoy the sport. I know of one motor boat club which has grown from a little group of ten members in the last five years to an organization of over 100 members. All of these men live in a city fifteen miles distant from the large river on the banks of which they have now built a comfortable club-house. And I know of several groups of out-door men who have shipped in to build little cabins on some picturesque bit of river shore and who find recreation in running down to the little home in the woods over week-ends. And on this river, which has a navigable length of some sixty miles, there is seen on Saturdays and Sundays a large and ever growing fleet of motor boats. Many simply take a spin for a few hours, others are off for the day with their families, and as many others make the run to the sea, some in cruisers and others with their camping duffle snugly stowed in the open runabout. In this procession of motor craft one sees a big variety of different types of boats. There are quite a few classy 35- to 70-foot cruisers but the majority of craft are smaller, running from 20 to 25 feet and about every type of motor boat is represented—raised-deck cruiser, hunting-cabin boats, runabouts of the latest types and a motley assortment of fantail launches, compromise-stern boats, plumb transoms, V-in and V-out and even the torpedo-stern type is still seen. Many of the craft are unmistakably home-made, crudely finished and gayly painted and striped but all are equipped with gasoline engines which make their shippers independent of wind and tide and take him and his family out into the fresh air and sunshine for a few hours' sail, a day's picnic or perhaps for a fishing or shooting trip. This is merely one matter-of-fact illustration but it shows the big appeal of the motor boat to a large class of out-door loving people, from the well-to-do manufacturer or professional man all the way down the financial scale to the clerk and factory worker who enjoys the sport in an inexpensive twenty-footer with a single-cylinder motor. And this illustration carries with it this moral: that you can enjoy the sport of motor boating likewise, for you neither have to possess the income of a banker or the skill of a mechanic to own and run your own motor boat.

In the words of Captain Jerry, that old sea-dog and former Grand Banks fisherman, "Motor boating is a sport with pep and tang. Any craft will do but a clean easy hull and a spankin' ingine will make a flying-fish of any man. Sails may do, but ye need a kicker to give all the fellers a holiday. I ain't much of a racing man but I kin see the p'int of the feller who itches to take the wheel of them speed machines. And them that doesn't want speed can buy a good open craft or a croosier or a staunch little ship like me Mary Ann, and jog along comfortable like ahead of wind and tide. If ye can't raise the wad for a big boat ye can get a good little one. Motor boating, me boy, is a sport for me and you and all that likes the water. It is a sport for all and no one is too old to enjoy it, no one too rich nor ag'in so lightly heeled that he can't own his own little ship." And with this statement of unexaggerated fact a thousand and one motor boatmen will at once agree.

I have visited a wealthy business man who has a large estate some fifty miles from a large city where his interests lie, and he has established a fast and agreeable express ferry service between the country home and his office by means of a fifty-foot express motor boat having a speed of 40 m.p.h. "I prefer the motor boat to the automobile," he recently told me, "because the run to the office in the morning and the return in the cool of the evening is the finest kind of a relaxation and tonic. When I jump into my boat in the morning I can look forward to a most enjoyable hour and a quarter in the cool, fresh air, and when I reach the office I am in fine fettle to tackle the work of the day. And after a hard day's work in the heat of the city the return trip gives me a chance to cool off and I am ready for dinner with a good temper and a healthy appetite." This is just one instance where the recreation of motor boating is happily combined with daily commutation—one phase of the pleasure and utility of the motor boat.

One of my good friends is a musician and composer and for the last three years has spent the greater portion of the summer months in a cosy bungalow on the shore of a 4-mile lake not far from this city. He is an enthusiastic fisherman and as there is plenty of bass and pickerel in the lake, I suggested that he would find a portable motor a handy thing to convert his fishing skiff into a self-propelling craft for trolling as well as for an occasional spin around the wooded lake. He is the most unmechanical fellow in the world but the easily handled and dependable little outboard motor has converted him into a motor boat follower for all time. When I visited him last summer I saw tied up to his little dock a spick and span little 22-foot motor runabout and he told me, "That little portable motor

It Is a More Distinct Change Than Any Other Sport



Photograph by John Kabel

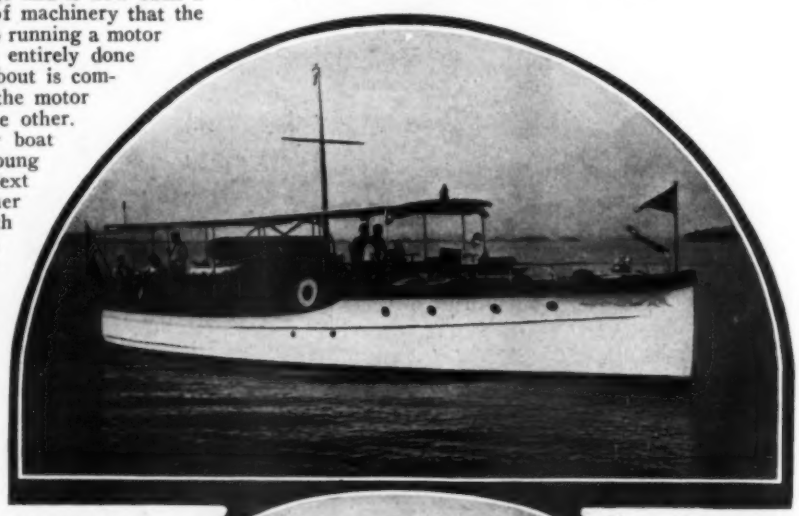
It is only on the water that a soft glowing moon beaming good naturedly down on mellow June nights gives the proper impulse to the dormant affection that lies in the hearts of wistful youth. There it is that the shimmering rays reflected a thousandfold on the dancnig wavelets bring back to ripe old age visions of that springtime of life when their thoughts lightly turned to love and memory travels back through years of happy companionship and blissful satisfaction

you advised me to buy has proven the best investment I have ever made. I have spent many pleasant hours in chugging around the lake in search of minnows for bait and for trolling my little engine has been always on hand to do the work better than the unreliable boatmen I have formerly hired. I have no more native ingenuity or mechanical ability than a child but I have had no trouble at all in running the motor and now I have a specially designed motor fishing skiff, with a well for the fish, and a convenient little boat for taking my friends out for a sail as well as for fishing." And this is merely another one of the many phases where the motor boat contributes a generous share of comfort and convenience to a hard working man who has found it a big asset for his hours of recreation.

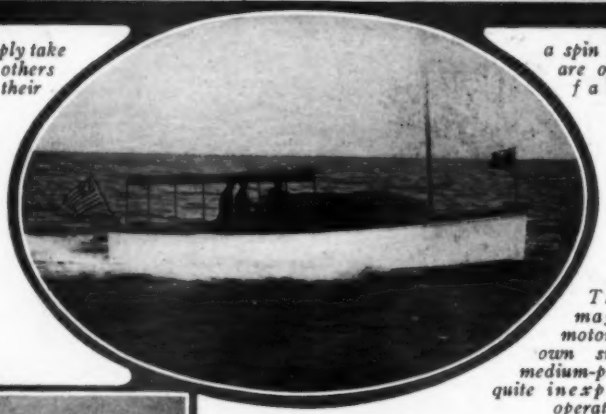
It would not be difficult to write an even hundred of examples where the motor boat has contributed big dividends in pleasure to men and women whom I happen to personally know. The modern internal-combustion motor has long passed its experimental stage and is now such a dependable and easily handled piece of machinery that the oil and grime and trouble, incidental to running a motor boat in the old days, has now been entirely done away with. The modern motor runabout is comparable with the motor car, because the motor is as easily handled in one as in the other. One of the most enthusiastic motor boat owners of my acquaintance is a young woman who has a summer home next door to mine. She is the proud owner of a thirty-foot runabout powered with a six-cylinder motor which gives a speed of some 35 m.p.h. The boat is moored directly in front of the cottage and my neighbor spends much more of her time on the water than she does in the family motor car. Not long ago she told me, "Motor boating is a really splendid sport for women and anyone who can run a motor car can manage a boat just as well. The motor in my boat Blue Bird is of 125 h.p. but it runs as quietly as the one in father's Packard car. I do all the work myself, except overhauling, which I turn over to the chauffeur, and I never had to be towed home yet. It isn't a bit more messy or smelly than a car and just think of the miles and miles of clean and smooth water I can travel over without running over a single chicken, and I don't have to wear goggles to keep the dust out of my eyes or honk-honk my horn every other minute, either." All of which is quite true for the motor boat has many advantages over the car and the sport has many charms all its own and it is by no means necessary to cast the slightest disparagement at the motor car

to popularize motor boating which is steadily growing as more and more out-door loving people hear the call of the water each month in the year. The sun never sets on this world-wide sport for when the craft is hauled out here in the North there are big fleets of pleasure boats in commission in Florida, California, Australia, Hawaii, and Timbuctoo.

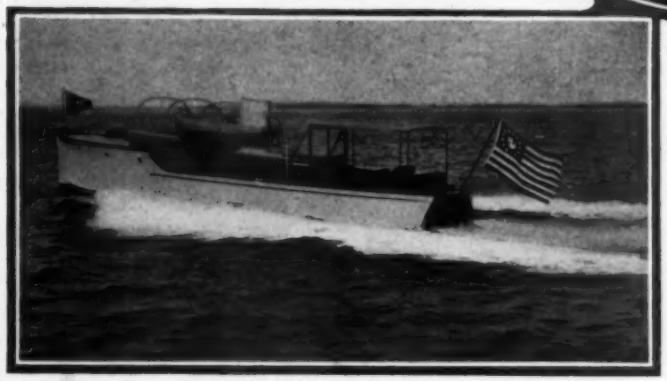
Now the fullest measure of satisfaction gained from any out-door sport must necessarily depend to a great extent upon how the sport is enjoyed—how the game is played. Many who have been attracted to motor boating have been unfamiliar with boats and marine motors and have purchased indiscriminately to own poorly designed and badly constructed boats or have had the unpleasant experience of having worn-out or otherwise unreliable motors wished upon them. I know several who have been badly stung by purchasing shoddy boats and power plants. In one instance the outfit was second-hand—old and worn out. In another case the boat was still serviceable but the motor was



Many simply take a spin for a few hours, others are off for the day with their families



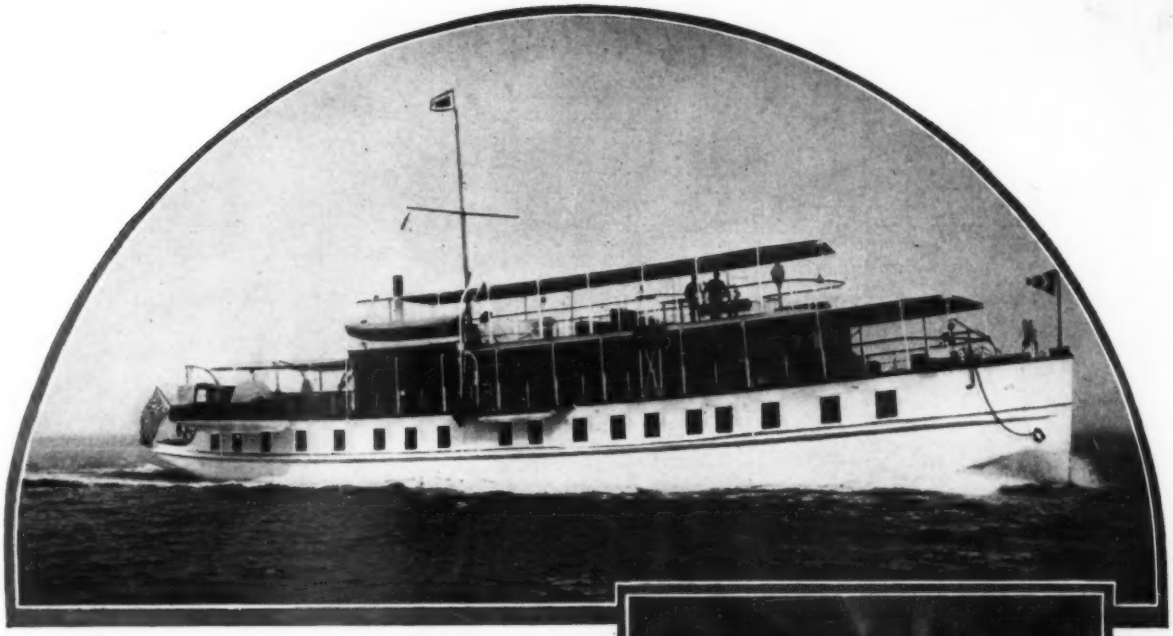
The great majority of motor boatmen own small- and medium-priced craft quite inexpensive to operate



There is a variety of sport in motor boating and the only qualification necessary to thoroughly enjoy it is a stretch of navigable water

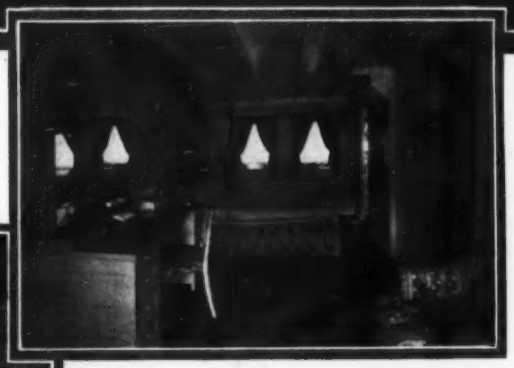
antique and fit only for the junk pile, and in the third case the boat and motor were new but cheaply built by a mushroom company who made a thrown-together outfit to sell for an attractive low price but not worth owning if given away. All of these men were discouraged with a poor outfit at the beginning but only one dropped out of the game and forswears boats forever more. This is mentioned to show that a boat and its motor should be purchased with discrimination, the same amount of buying-sense which the average person usually exhibits when buying anything for which he pays a good price. At one time in my checkered career I was interested in the automobile business and saw many cars change hands in the second-hand mart that were as thoroughly doped for sale as the worst example of horse

(*Continued on page* 68)



The Trend in Motor House-Yacht Design

By Henry J. Gielow



One of the many guest staterooms on Captiva

Deck view on board Payne Whitney's motor houseboat Captiva

AT the mention of the word houseboat, our thoughts will instinctively fly to the "silver Thames," where houseboating has been a feature for many years, and where it is markedly in evidence during the height of the summer season, particularly during Henley regatta week. The mental picture presented is that of a barge with a light wooden superstructure, surmounted by an awning or shade deck, with comfortable and roomy accommodations within—a bungalow afloat, without motive power, moored at different points along the picturesque reaches of the stream.

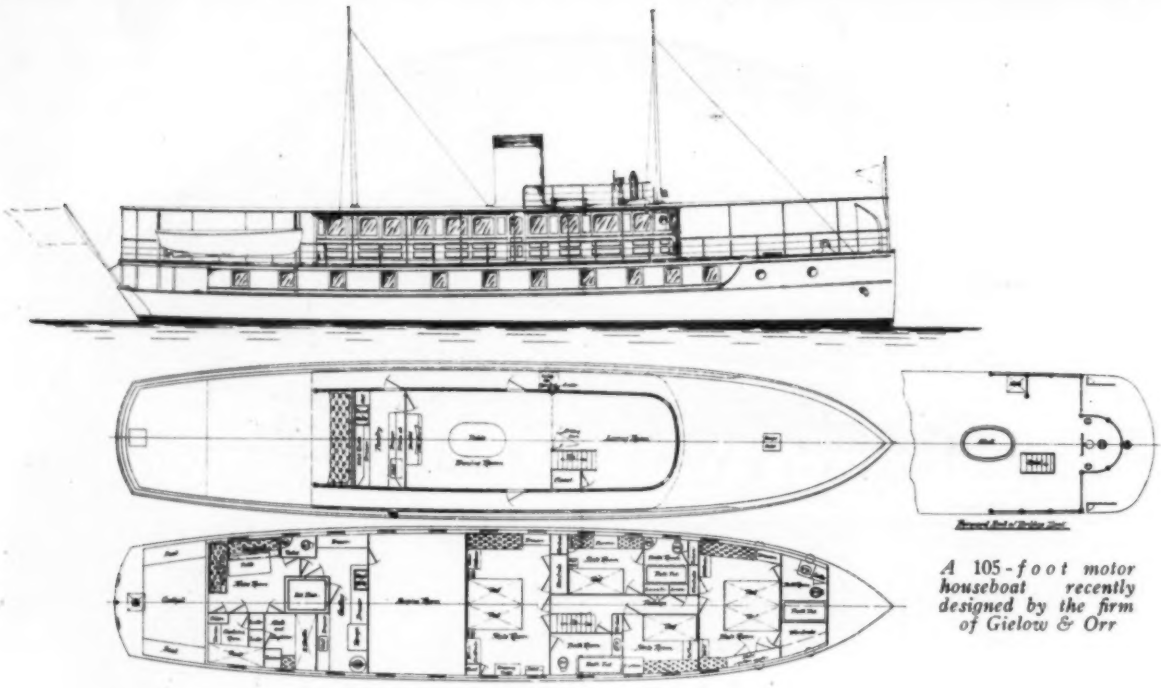
Here in the United States, with our great distances, diversity of cruising grounds, ranging from the beautiful shores of Long Island Sound and the New England coast, down to the sunny lagoons, shallow streams, and inland waters of Florida, the splendid reaches of the Mississippi and St. Lawrence Rivers, and also the waters and picturesque shores of the chain of "Great Northern Lakes," from Duluth to the head of the St. Lawrence River, new conditions have presented themselves, requiring a craft combining the sea-going qualities of a good yacht with the more material comforts of a houseboat. Light draft is essential for winter cruising in southern waters, and a fair amount of speed and sea-going qualities are also required to enable the owner to make the long runs between the winter and summer cruising grounds.

Conditions in Europe during the last four years have not been conducive to foreign travel, so that our busy Americans have sought rest and recreation nearer home, thus learning that aside from romance of antiquity of Europe and the Orient they are learning that in natural charms our great country stands second to none.

Florida, and the adjacent South, has become the "Mecca" during the winter months, and the social pleasures ashore have been rounded out by fishing, boating and kindred health giving pleasures, giving a more than ordinary impetus to houseboating, which is well attested by the fact that Gielow & Orr, of New York, Naval Architects, completed plans for seven houseboats for their clients, to be built during the summer months, and to be ready for use in Florida by the end of the current year.

The largest of these craft has the following dimensions: Length overall 120 feet 6 inches, length on load waterline 115 feet, beam 21 feet 6 inches, and a draft of 3 feet 6 inches. The next in size has an overall length of 115 feet, load waterline length 112 feet 6 inches, beam 21 feet, and a maximum draft of 3 feet 6 inches. Next comes a group of four boats ranging from 92 feet to 95 feet in overall length, with corresponding lengths of load waterline, the beam ranging from 18 feet to 19 feet, and all with a draft just under 3 feet 6 inches.

The living accommodations are designed to meet the individual requirements of the different owners, so no two are alike; but the arrangements in a general way comprise two double staterooms, each about 10 feet by 15 feet; two single staterooms, each about 7 feet by 9 feet; and three bathrooms; large wardrobes and ample locker and storage space for owner and guests; also excellent quarters for



A 105-foot motor houseboat recently designed by the firm of Gielow & Orr

officers and crew. A large ice-box and cold storage space, and liberal galley. The finish below will be in ivory white and tints. Deck houses will be of mahogany finished bright, and will contain living room 11 feet by 14 feet, dining room 11½ feet by 18 feet, and pantry, with dumbwaiter to galley.

The mechanical installation will be of the twin screw type, giving the boats an easy cruising speed of 12 miles, with a maximum speed of 13½ miles per hour. These boats will be provided with electric lighting plant, searchlight, and storage battery; they will be steam heated. The accompanying illustrations are representative of the type.

The smallest craft is of the following dimensions: Length overall 58 feet, length on load waterline, 56 feet 8 inches, beam 17 feet 6 inches, and 3 feet draft. This is an especially attractive craft for a small party, as it contains three staterooms, two being double, the larger one will be 8½ feet by 13 feet, the smaller one 7 feet by 10 feet, and the single stateroom will be 6½ feet by 8 feet, there will be one large bathroom and one lavatory and toilet room. The mahogany deck house will be 9 feet wide by 16½ feet long in the clear.

The propelling machinery will be a pair of gasoline engines, driving twin screws, there will be an electric lighting plant, storage battery, steam heating plant, etc. In fact, this craft will have all the desirable features of her larger sisters, but on a smaller scale.

In appearance these houseboats take something of the lines of a yacht of the larger type, with their large central funnels and fore and main masts, and look little like the mental picture of barge like houseboats that one generally conjures up. In fact, with their several decks from a distance they appear much like miniature sound and lake steamers of a well-known type. There are few port holes proper on houseboats, their roominess making it possible to use square lights or windows, which is, of course, a decided advantage.

The staterooms are divided by the engine-room, which is located just abaft the beam and extends clear across the boat.

The spaciousness of the rooms in a country home are surpassed by those on a modern houseboat

A scene which will soon be a common sight on many waters

Back row: Ensign Hendricks; Boatswain Gauff; Ensigns Douglas, Curtiss, Harsch, Dunn, Gray, Fox, Thomas, Welmore, and Still. Front row: Ensigns Breck, Weed, Schiek; Lieut. (j.g.) McNeill, Capt. Edward A. Evers Commanding, Lieut. Derby, Lieut. Glaubitz; Ensigns, Garthwaite and Hitzel

The Making of an Ensign

Largest Naval Auxiliary Reserve School Conducted by Members of Chicago Yacht Club, Developed Naval Officers from American College Men

By Robert H. Moulton

Photographs by Lieut. W. M. Derby, Jr.

NAVAL activity a thousand miles from the nearest salt water sounds rather paradoxical. Sailors—trim, jaunty, clean-cut lads practicing the arts of naval warfare and talking the quaint jargon of the great fleet, where the tide neither ebbs nor flows, might seem at first blush sadly marooned in the inland State of Illinois.

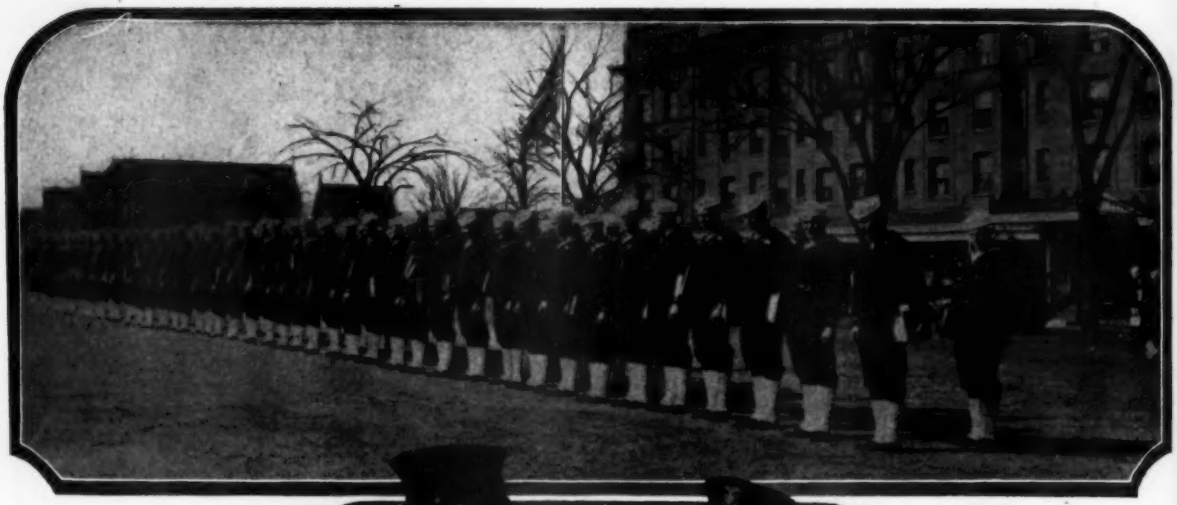
But there is no actual anomaly. Up to a few months ago Uncle Sam was molding men in the native heath of the world's finest brain and brawn. He was taking men, mostly college graduates, and turning out, Gold Stripers, to officer the new merchant navy. He was doing this at the school known as the U. S. Naval Auxiliary Reserve School which occupied over half of Chicago's huge Municipal Pier that juts a full mile into Lake Michigan.

The Municipal Pier School, which was the largest Naval Training School outside of Annapolis, having at one time an attendance of 1,750 and keeping an additional 450 to 600 men on the Lake Michigan ore boats, was the direct outcome of a meeting of members of the Chicago Yacht Club in December, 1916, when the subject of offering their services to the government, in case the United States was drawn into the war, was discussed. During the next two months they were assured by Captain Moffett of the Great Lakes Naval Training Station that he would need their best yachts for patrol and their best navigators as instructors, as some 9,000 officers would be required and only 2,700 were in sight.

On the night of March 7, 1917, this handful of men calling themselves, The Yacht Owner's Association of the Chicago Yacht Club, decided to create a school for the instruction of youths in navigation and kindred subjects the very next morning. This action represented the first civilian anticipation of the great naval change to

The students were given real training in seamanship and navigation on Lake Michigan. SP 216 is Hyac

Going to recitation at the University of Chicago in charge of officers from pier



Blue jackets at the University of Chicago in charge of the officers from pier. Note the copies of Bowditch under their arms

At the left: Ensign Dunn and Lieut. Sensen, two of the school's hardest workers

come and proved to be more prophetic than expected.

On the following day was organized the Chicago Yachtmen's Naval Auxiliary, composed of all the water-going organizations of the city and its environs, and classes for instruction in navigation were immediately started in the clubhouse of the Chicago Yacht Club. The clubhouse was soon filled to overflowing, necessitating the taking over of the Edison building. This building in turn was quickly outgrown and the school moved to the Municipal Pier, its permanent home, where it occupied two floors, each 3,000 feet in length. From that time on until the signing of the armistice approximately 200 trained men left the school each month for a final two months' finishing course under the Supervisor, Naval Auxiliary Reserve at Pelham Bay, N. Y. By September, 1918, some 400 Ensigns and Lieutenants, products of the school, were on the ships plying between America and France.

In the beginning the expenses of the school were borne by members of the Chicago Yacht Club and when it moved to the Municipal Pier $16,000 was donated by the Commercial Club of Chicago for equipment. In all, about $30,000 was furnished by patriotic citizens of Chicago. The Chicago Board of Education rendered valuable aid to the school by furnishing numerous chairs, desks, blackboards and bookcases. Y. M. C. A. rooms were installed, as well as a sick bay, to which was added an ambulance, the gift of Mrs. Castleberry, of Chicago. In June the school was made part of the nation's armed forces, taking the name—United States Naval Auxiliary Reserve Force. Early in July regular enlistment became necessary before students could receive instruction at the school.

On August 28, Captain Moffett ordered the U. S. S. Gopher to move alongside the Pier and act as training ship for the students. Lieutenant A. M. Steckel, commander of Gopher, was thereby made commanding officer of the school. Others who served in this capacity later were Lieutenant-Commander L. R. Rutter, Lieutena nt (j. g.) B. C. Getsinger, and Captain A. E. Evers.

From this base of operation Gopher took 450 students, fifty at a time, on a three weeks' cruise about the lakes, giving them actual training in steering, signaling, navigation, gunnery, and all the rudiments of the life that they expected to lead later on the sea. At the end of the three weeks' cruise Gopher landed its student squads at the Great Lakes Naval Training Station and returned to the Pier for another load.

Gopher's program was kept up until November, the expense of the school, furnishings, and equipment other than that furnished by Captain Moffett, which was all and perhaps more than he could spare, being still borne by the Chicago Commercial Club. Leaders of the school work were William M. Derby, G. L. Weed, C. W. Schick, William T. Cooper, and Paul Springer, who were sworn in as naval reserve officers. On February 8 the Navy Department at Washington assumed the expense of maintaining the school, thus relieving the Commercial Club which had for almost a year gladly financed the patriotic enterprise.

With the opening of navigation in 1918 the Patrol Boat S. P. 216, the $30,000 steam pleasure yacht, known as Hyac, which was owned and operated before the war by William M. Derby, was assigned to the Pier and made four trips daily, taking classes out into Lake Michigan and instructing them in actual steering, charting, compass reading, sextant work, and all the myriad traditions and practices of boats on the high seas. On landing from S. P. 216 the classes hastened to rooms on the Pier where other officers lectured, quizzed. and illustrated theories in manifold form.

When the student's two months at the Pier school were up he was sent to Cleveland where Ensign E. N. Wood, Assistant Supervisor, U. S. N. A. R. F., assigned him to a practice cruise of two months on some lake carrier—an iron ore, grain or lumber freighter. With another sailor—the jackies took this course in pairs—he embarked, becoming one of the crew, subject to orders of the ship's captain. On this ship he had instilled in him the discipline of the vessel, the Rules of the Road, the handling of large vessels, the construction of a ship, the management of the wheel, etc. For two months he led this life, submitting at the end of the trip, for examination, criticism, and grading, a detailed log of duty performed and subjects studied during the voyage. From the Master of the ship he received a report concerning his actions, which, together with his own drawings and notes, he presented to his officers at the Pier.

On reassembling at the school after their lake experience the learning of the students was systematized, and for another month they worked at the Pier. At the end of this month the students, after careful inspection, were sent to the finishing school at Pelham Bay.

An Amateur Builds a Motor Boat

Gladine II, a 21-Footer, Was Built from the Ways Up by a Novice Who Used as His Only Guide Twenty-Four Numbers of MoToR BoatinG

By Walter W. Monroe

THE word amateur is used in its truest sense. He realizes that there are many features about the boat Gladine II that would not be considered good practice. The experience, however, was very interesting and of course has brought many of the faults of the boat to the writer's notice.

The work was taken up for the pleasure of the employment, and the result has been a motor boat which has given the amateur and his family much pleasure and recreation in its use.

Usually when an account under the above heading is offered it is necessary to obtain several catalogs of knock down boat builders and after purchase and receipt of the material, "the amateur builds a boat." Perhaps the builder really does lay down the lines from plans furnished by some reliable naval architect, and while this method is recommended, it is not the way that Gladine II came into being.

The motor was built from the ground up, not from designs of the gas engine expert, but according to the best ideas of the amateur. Don't attempt to build a power plant in this way, unless you have plenty of stand pat, and are not in a hurry.

Access should be had to some of the more common machine tools, such as the engine lathe, planer, driller, miller, with index attachment for cutting the gears for the vertical timer shaft and the reverse gear, and a cylindrical grinder.

The only part of the work which the amateur would dare to claim a thorough knowledge of, would be pattern-making, consequently the making of the patterns for the engine did not suggest the pleasure that the machine work and boat building did.

The pattern making was turned over to students of Mechanical Engineering at the Worcester Polytechnic Institute, who were taking a course in pattern making under the direction of the amateur boat builder.

Many of the students found very interesting work along practical lines in the construction of these patterns. This practical work was carried into the foundry, which is a commercial enterprise employing journeymen molders, but connected with the above institute, so as to give the students practical instruction, and some of the students produced castings from the patterns which they made in their previous shop work.

The engine is of the two-cycle type, and some of its features are a governor operating a spark advance, and this same device breaks the primary electric connection on over speed, so that much of the tendency to race is avoided. An air heater is provided as a part of the exhaust manifold, and all the wiring is carried through copper tubes.

The ignition is the common jump spark operated by either dry cells or storage battery, the latter supplying electricity for the running lights.

Several weeks of the amateur's vacation were taken up with the machining of the engine parts, and views of the rough castings and completed engine are shown.

The model of the hull was made to 1½ inch to the foot scale and was cut into at the location of the stations. Cardboard was inserted in these cuts, carefully marked, and the form of the stations enlarged from these small patterns.

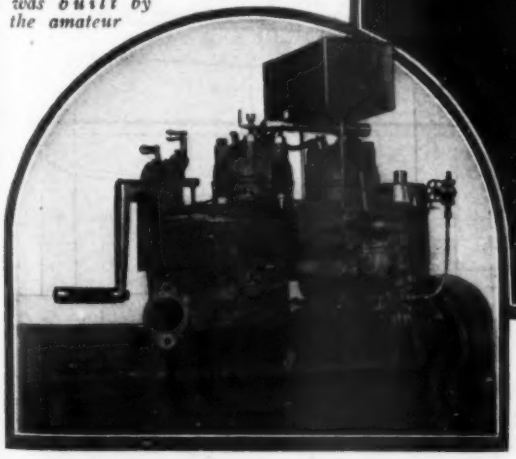
The keel and keelson were made from one piece of 2¼-inch oak. Mortises were made clear through the keel for the ribs, and a rabbet ¼-inch deep was cut in the keel for the garboard strake.

A view of the inverted form with keel, engine bed and a few of the ribs in place is shown, as well as a view of the fully planked hull.

The planking was 9/16-inch white cedar fastened with brass screws and all the bolts were made of bronze.

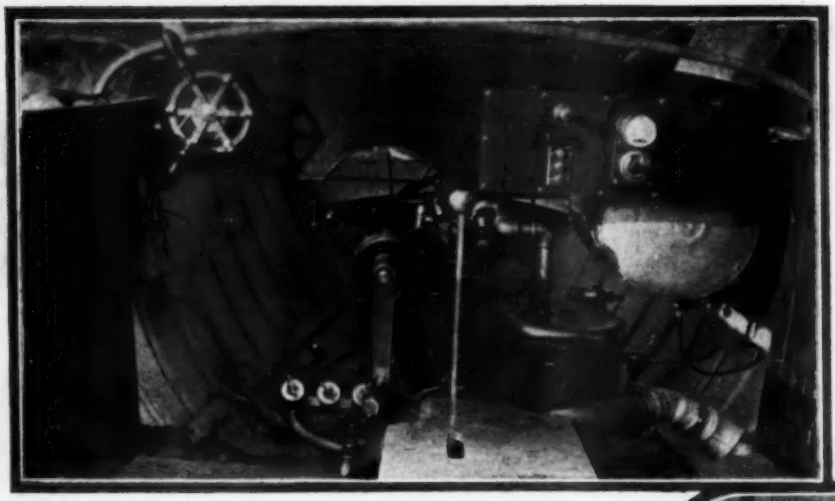
The engine sills, which are 9 feet long, were placed in cuts in the stations before any ribs were bent in. After the ribs were in place these sills were dressed down flush with the ribs, so that the sills rest against the planking their entire length.

A spruce bilge stringer extends the entire length of the hull and is riveted to every other rib. The ends of the floor timbers are fastened to these stringers and also to the engine sills and keelson.



A two-cycle engine with a governor operating a spark advance was built by the amateur

The keel and keelson were made from one piece of 2¼-inch oak. Mortises were made clear through the keel for the ribs, and a rabbet ¼-inch deep was cut in the keel for the garboard strake



For ignition the common jump spark was decided upon, and it was so arranged that it could be operated by either a storage battery or dry cells. This same storage battery was also used for supplying electricity for the running lights

Gladine II is 21 feet long by 5 feet 6 inches beam, and makes a little better than 9 miles, with her present propeller outfit, which is also a student pattern and amateur machine work.

The carbureter, spark coil, and spark plugs used, can be found on the market, but outside of these, practically every piece of hardware and equipment is amateur made.

The only source of information which the writer had previous to attempting this work was about twenty-four numbers of MoToR BoatinG, and he could handle a rowboat fairly well on fresh water.

The answers to the prize contest probably were of the greatest help.

Under the engine three heavy oak pieces extend the full beam of the boat and are bolted to bilge stringers, sills and keelson. Over these cross pieces the wedge pieces which line the engine with its propeller shaft are fitted and bolted. A reverse gear was designed to fit an extension of the engine crankcase.

The cockpit is ceiled below the coaming with four panels on each side, which provide small but very handy locker space.

The stern seat with its lazy back can be removed entirely so as to give ample space to get at the steering quadrant. The seat also stores two standard life belts.

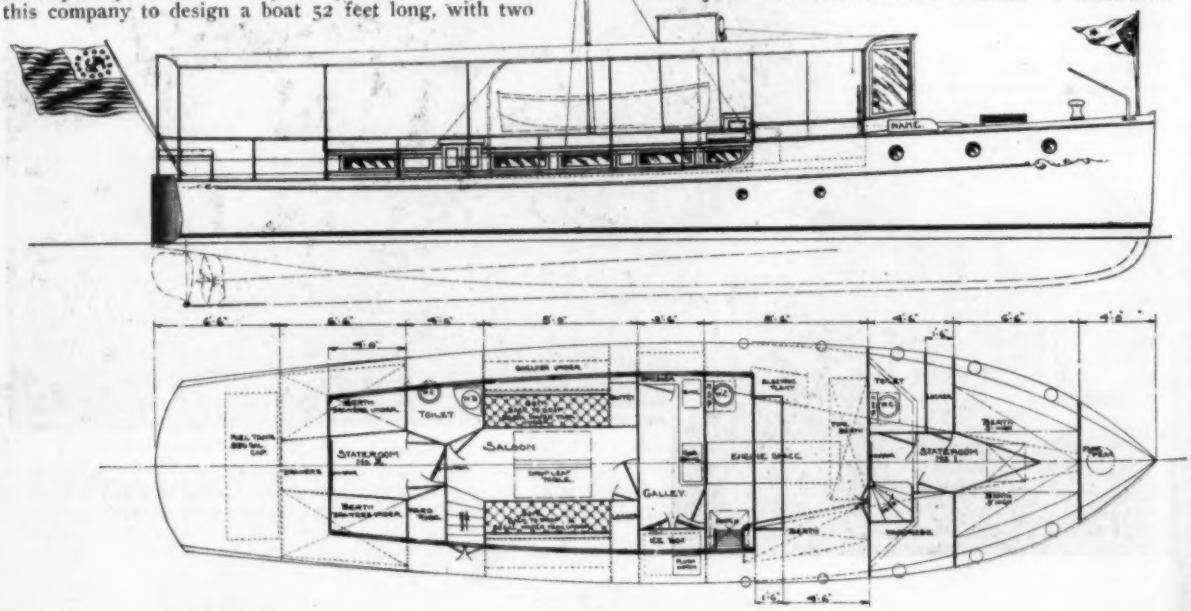
All the interior woodwork and deck are mahogany finished bright.

Students of the Mechanical Engineering Department of the Worcester Polytechnic Institute who were taking a course in pattern making under the direction of the amateur boat builder were entrusted with the work of making the actual patterns—and they did a good job

Sixty-Foot Accommodations in a 52-Footer

COMPRESSING sixty feet of conveniences into fifty-two feet of space without cramming or overcrowding presents quite a problem in boat building, but the New York Yacht, Launch & Engine Co., of Morris Heights, N. Y., were called upon to accomplish just that recently. A yachtsman requested this company to design a boat 52 feet long, with two staterooms and a saloon in addition to engine-room and galley.

Ordinarily this amount of accommodations usually requires all of 60 feet, but the expert draftsmen of the corporation were put on the job and the boat was laid out. Just how well she was laid out is illustrated.



Graphic Navigation

An Illustrated and Diagrammatic Description of Methods by Which the Position of a Ship at Sea May Be Determined with the Use of Higher Mathematics Reduced to a Minimum

By Capt. A. C. Knight

IV—DETERMINATION OF POSITION BY MEANS OF STAR SIGHTS

Note: This Series Began in February MoToR BoatinG.

"FOR the student of practical nautical astronomy, or position finding at sea, by means of the heavenly bodies, the requirement may be stated as follows:

Ability to observe the altitude of any heavenly body (sun, moon, planet, fixed star), and to work the sight for position; to understand its value and to plot it on chart, and to determine position of ship by combining two or more position lines.

Use the method of Saint Hilaire, which may be regarded as standard up-to-date practice."—Lieut. Commander Gilbert P. Chase, U. S. Navy.

The First Point of Aries (♈) is a fixed point in the heavens from which, with respect to the Earth, the angular distances of the Sun, Moon, Planets, and Stars have been measured and the results tabulated for use.

This angular distance is called Right Ascension and is always measured from Aries (♈) toward the east to the body.

For instance, Right Ascension of the Mean Sun is the angle at the centre of the Earth between a line to Aries and a line to the Mean Sun, with Aries always to westward and the Sun to eastward, see Fig. 30.

Since Greenwich Mean Time is the Hour Angle of the Mean Sun from Greenwich (angle at the centre of the Earth between a line to Greenwich and a line to the Mean Sun measured toward the west from Greenwich), see Fig. 31.

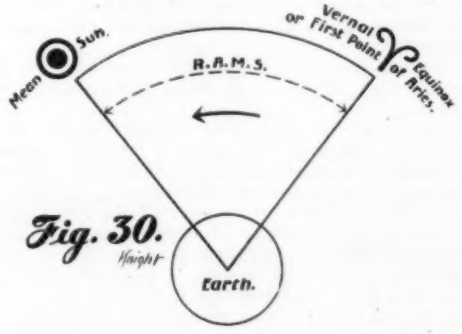


Fig. 30.

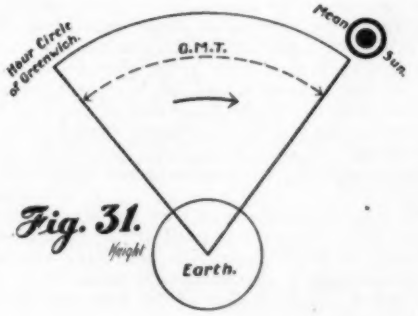


Fig. 31.

It follows that the sum of these angles will be the angular distance at the center of the Earth between Greenwich and Aries, and this is called Greenwich Sidereal Time (G.S.T.), see Fig. 32.

If we apply to Greenwich Sidereal Time, our longitude, subtracting if west, adding if east, we get Local Sidereal Time (L.S.T.), or the angle at the center of the Earth between the respective hour circles of ourselves and Aries, adding twenty-four hours if necessary to G.S.T. to perform the subtraction, see Fig. 33.

If we apply the Right Ascension of a star to Local Sidereal Time, subtracting the less from the greater, the remainder will be the angular distance between ourselves and the star, measured at the centre of the Earth, which is the Hour Angle (t), see Fig. 34.

EXAMPLE

FIRST STEP—Tabulate the Data

Nov. 10, 1918, p. m.			
Lat. by D. R.	40°	30′	N.
Long. by D. R.	69°	25′	W.
C. — W.	5h	25m	15s
C. C.	—	5s	
I. C.	0		
Height of eye	42 feet		

Obs. Alt. ★ Hamal, 40° 4′ 50″, at W.T., 6h 12m 10s bearing east.

Obs. Alt. ★ Altair, 43° 57′ 10″ at W.T., 6h 14m 22s bearing S.W. by W.

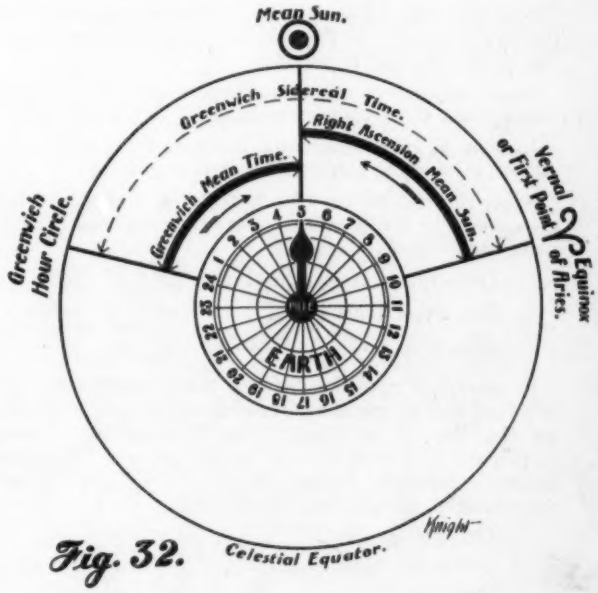


Fig. 32.

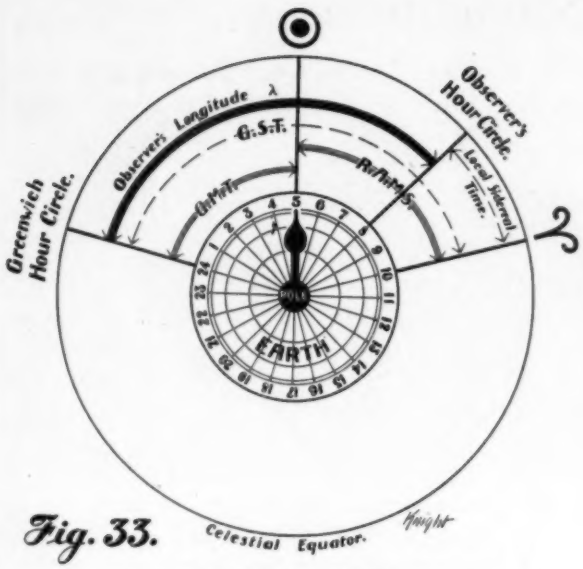


Fig. 33.

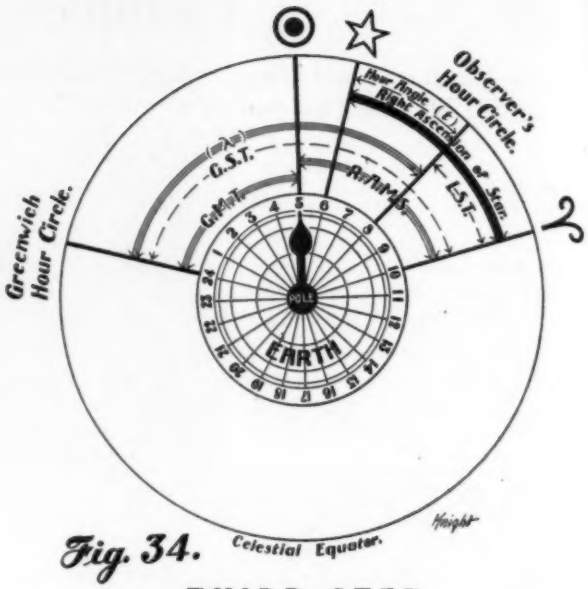


Fig. 34.

SECOND STEP

Get the Corrected Altitude of both stars (h).

Use table 46 Bowditch, column for stars, giving the Mean Dip and Ref.

Stars have practically no diameter or parallax, owing to their tremendous distance from the Earth. Their discs appear as points of light and the angle due to parallax is negligible.

The identity of the observed star must be known to a certainty.

Fig. 35 is a sketch of the heavens as they might have appeared on evening of Nov. 10, 1918, at the hour and place of observation.

There must be sufficient light in the sky, at least low down, for the horizon to be distinctly visible.

Make observations as soon as stars of the greater magnitude are seen.

Choose stars that are neither close together nor at opposite sides of the heavens from each other.

Mentally note the pattern formed by stars grouped with the star observed (see Fig. 36), then find this pattern on a star chart and identify the stars.

Chart number 2,100, Constellations of the Northern Hemisphere, U. S. Hydrographic Office, is a good chart.

In table 46, column for stars, under 42 feet and for Obs. Alt. of 40° find the correction, — 7 feet 30 inches.

Apply this and get the Obs. h of the ★ Hamal, which is the quantity to finally compare with the calculated h of the same star.

Obs. Alt. ★ Hamal	40°	04′	50″
Correction, table 46	—	7′	30″
Obs. h	39°	57′	20″

By mental interpolation between the corrections for altitudes 40° and 45° get the correction for 43″ 57′, or roughly 44° the Obs. Alt. of Altair. The difference for 5° being — 11″, for 1° it will be — 2″ .2, or say — 2″. Applying this to the correction for 45° which is — 7′ 19″, get — 7′ 21″, the correction for the Obs. Alt. of Altair.

Obs. Alt. ★ Altair	43°	57′	10″
Correction, table 46	—	7′	21″
Obs. h	43°	49′	49″

THIRD STEP

Get the Greenwich Mean Time (G.M.T.). (See article on longitude in March issue.)

Watch time of first sight (W.T.) ★ Hamal.	6h	12m	10s
Chronometer minus watch (C — W)	5h	25m	15s
Chronometer time (Chro. t)	11h	37m	25s
Chronometer correction (C.C.)		—	5s
Greenwich Mean Time (G.M.T.)	11h	37m	20s
Watch time of second sight (W.T.) ★ Altair	6h	14m	22s
Chronometer minus watch (C — W)	5h	25m	15s
Chronometer time (Chro. t)	11h	39m	37s
Chronometer correction (C.C.)		—	5s
Greenwich Mean Time (G.M.T.)	11h	39m	32s

FOURTH STEP

Get the Right Ascension of the Mean Sun (R.A.M.S.).

It will be found in the nautical almanac for Greenwich Mean Noon and must be corrected for time past noon if there be any.

A sidereal day (star day) is almost exactly the length of time taken by the Earth to make one complete revolution on its axis.

Owing to the Earth having a yearly motion around the Sun in the direction (east) which makes it necessary for the Earth to turn slightly more than one full revolution on its axis to bring the same meridian on the line from the center of the Earth to the center of the Sun each twenty-four hours, the solar day is longer than the sidereal day by about 3 minutes and 55.9 seconds, and it is on this account that the correction must be made for time past noon.

The R.A.M.S. is correct for G.M.N. of the date, but no Right Ascension has been allowed for the hours and minutes of solar time past noon, which is the widening of the angle between Aries and the Sun, continually going on; in other words, the increase of Right Ascension. See Fig. 37.

If in lieu of a star in the illustration, the First Point of Aries had been used (not a star, but nevertheless a fixed point in the heavens), the angle representing additional turn would be the Right Ascension of the Sun for the first day after Aries and the Sun had been in conjunction at the upper transit of some meridian. The Right Ascension of the Sun would then be 3 minutes and 55.9 seconds approximately.

This angle becomes wider as the Earth moves around the Sun from day to day, until at the expiration of a year the angle of Right Ascension will have reached the full twenty-four hours, the Earth will again be at the starting point and Right Ascension of the Sun will begin anew for another cycle.

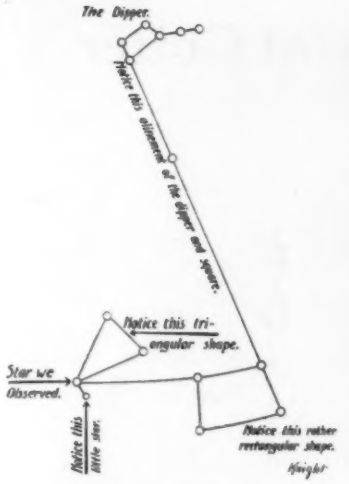


Fig. 36.

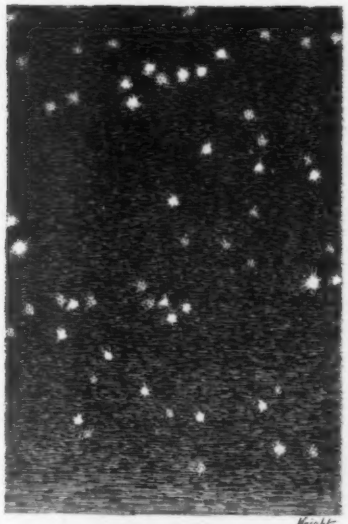


Fig. 35.

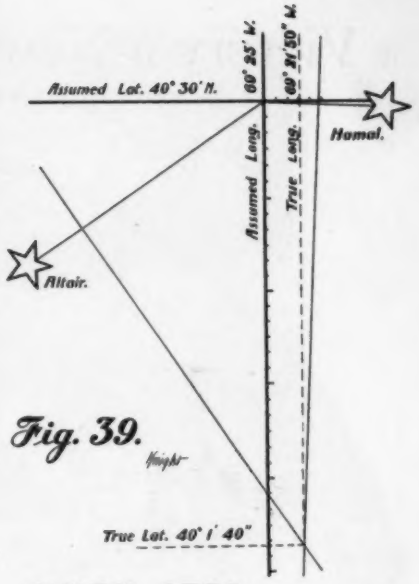


Fig. 39.

In the example there are 11^h 37^m past G.M.N. for which get the Right Ascension.

Use table III nautical almanac, corrections for hours and minutes to be added to a mean time interval to get sidereal time. This angle is the same as the increase in Right Ascension, thus:

R.A.M.S. for G.M.N. Nov. 10, 1918.....	15^h	15^m	$20^s.1$
Correction, table III, for 11^h 37^m.....	+	1^m	$54^s.5$
R.A.M.S. for G.M.T.	15^h	17^m	$14^s.6$
R.A.M.S. for G.M.T., without fractions of seconds	15^h	17^m	15^s

FIFTH STEP

Get the Greenwich Sidereal Time (G.S.T.).

Add the Right Ascension Mean Sun for G.M.T. to the Greenwich Mean Time and the sum will be the Greenwich Sidereal Time, or the angular distance between Greenwich and the First Point of Aries measured in time. Thus:

G.M.T. first sight.....	11^h	37^m	20^s
R.A.M.S. for G.M.T.....	15^h	17^m	15^s
G.S.T.	26^h	54^m	35^s
G.M.T. second sight.....	11^h	39^m	32^s
R.A.M.S. for G.M.T.....	15^h	17^m	15^s
G.S.T.	26^h	56^m	47^s

See. Fig 32.

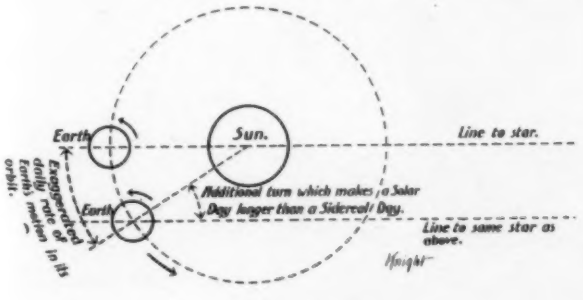


Fig. 37.

SIXTH STEP

Get the Local Sidereal Time (L.S.T.).

Greenwich Sidereal Time minus Longitude in Time if west or plus Longitude in Time if east is Local Sidereal Time or the angular distance, measured in time between the First Point of Aries and the position of the observer, thus:

15)69° 25′ W., assumed longitude divided by 15 reduces it to time.

4^h 37^m 40^s

G.S.T. first sight.....	26^h	54^m	35^s
λ W.	4^h	37^m	40^s
L.S.T.	22^h	16^m	55^s
G.S.T. second sight.....	26^h	56^m	47^s
λ W.	4^h	37^m	40^s
L.S.T.	22^h	19^m	7^s

See Fig. 33.

SEVENTH STEP

Get the Hour Angles and Declinations of both stars.

Right Ascension and Declination of stars will be found in the nautical almanac for the year and first of each month. There is so little change in Right Ascension and Declination of stars that a few days more or less need not be taken much into account.

(*Continued on page 62*)

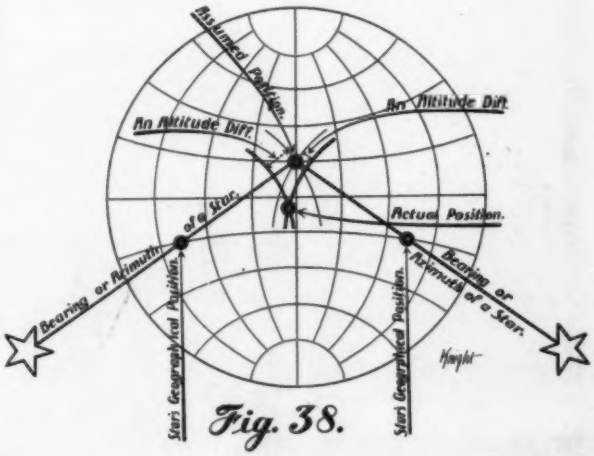


Fig. 38.

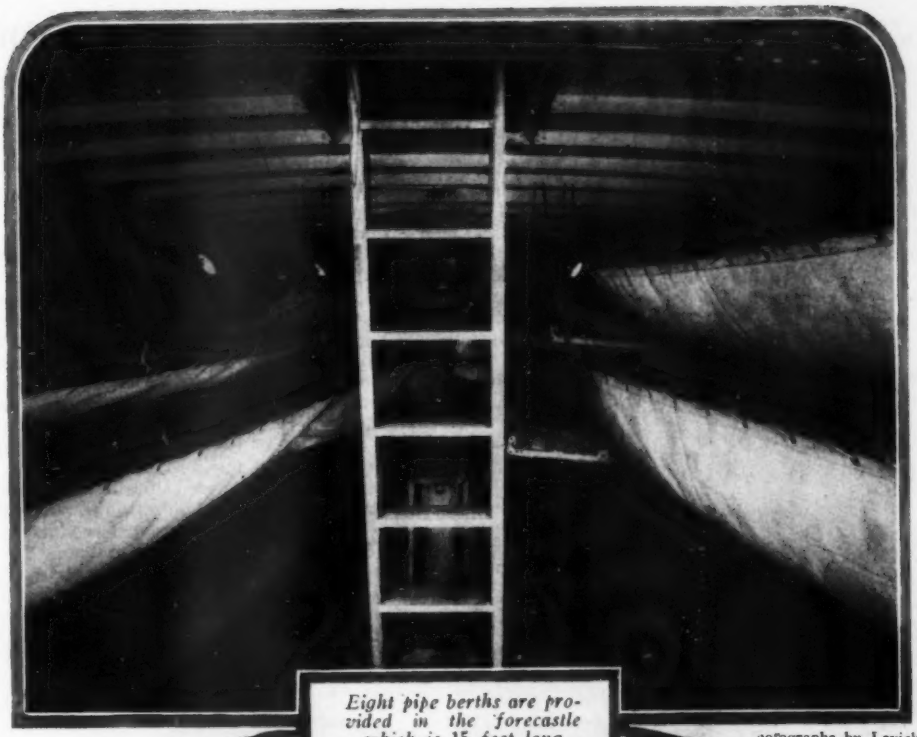
Victory a New Type Coast Guard Cutter

Built with Lines Like a Destroyer—Long, Lean, Lithe

Victory is a 93-footer of almost complete steel construction and was built by the American Balsa Co. of Long Island City, N. Y., after plans by W. Gardner & Co., of New York City. Powered with Sterling engines she is capable of maintaining 22½ m.p.h. indefinitely. Presently she is operating between Quarantine and the Battery in New York harbor. Gun platforms have been installed. There is a wireless room and she is divided into four compartments by solid steel bulkheads so that she may be quickly converted into a fighting craft. The Sterling twin 300 h.p. motors were selected as conforming to Government specifications, which called for a power plant capable of retaining full power at a speed not in excess of 1,000 r.p.m. She has been pared down trim to the point of severity, and slips through the water with a rush that recalls the speedy larger destroyers

Balsa wood which does not splinter is used in the living quarters

Besides the main cabin 10 feet long there are two staterooms



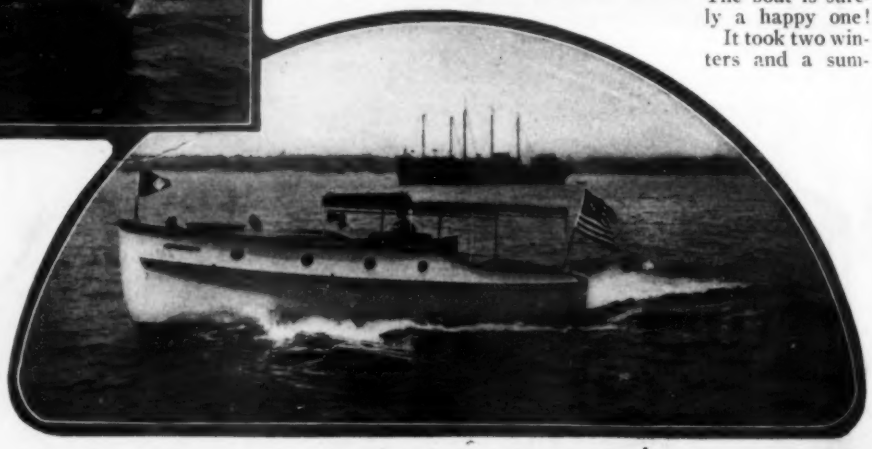
Eight pipe berths are provided in the forecastle which is 15 feet long

Photographs by Levick

The power installation consists of two 300 h.p. Model F Sterling engines

A Twenty-Eight-Foot Cruiser Good Enough for Anyone

CONSORT II, or, as the name appears on the bow, it reads Idylease II, is one of the successful little cruisers built from the plans of F. S. Nock, of East Greenwich, R. I., which were published in MoToR BoatinG some months ago. She was built, single handed, by Charles E. Grush, of Beverly, Mass., who has never outgrown his boating enthusiasm in more than forty years. He builds his own boats and claims that he has more sport in building than running them afterwards; in fact he is acknowledged to be a past master among amateur boat builders.

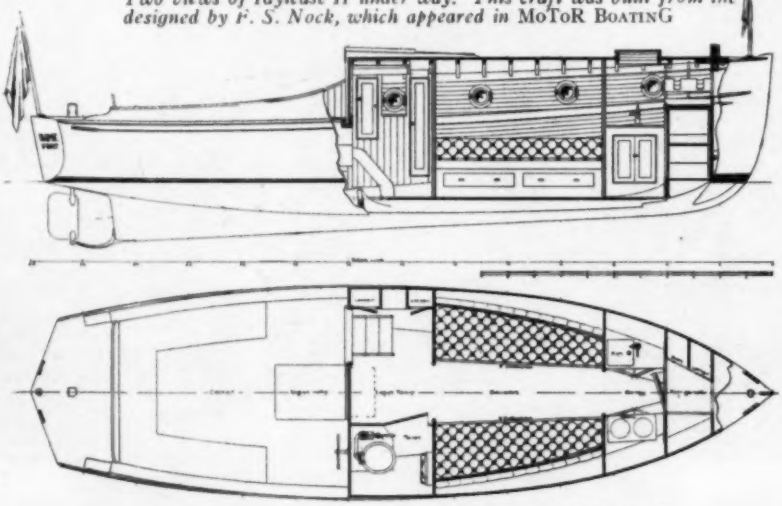


Two views of Idylease II under way. This craft was built from the plans of Consort II, designed by F. S. Nock, which appeared in MoToR BoatinG

The boat is a sporty, well-balanced little cruiser and the picture tells the story from the outside. Inside, beginning at the bow, is the customary chain locker, next is the galley which has a porcelain enameled sink with running water supplied from a tank under the cockpit floor, a two-burner oil-stove furnishes the hot stuff, a gem of a white metallic ice-box furnishes the cold stuff, while lockers in every conceivable place furnish the canned food and supplies. The entire cabin is finished in white enamel with mahogany trim, the green kapoc filled, corduroy cushions on extension berths, with carpet to match, together with miniature electric light fittings at once impresses one with the fitness of the name Idylease II. The toilet is fitted with a Curtis closet and is also the location of a 6-80 storage battery, which is kept up with a 10-ampere Apple charging dynamo. Electric lights, klaxhorn, binnacle, switchboard, cabin, and trouble lights are supplied from this source and plugs and outlets are found in every nook and corner.

The power plant is a 4x5, four-cylinder, four-cycle, valve-in-head Erd motor having a Joe's gear, Kingston carbureter, and Dixie magneto with an impulse starter, so that no battery or cautionary setting of the spark is necessary when starting. Very satisfactory results have been acquired with a 20-20 type "A" Columbia wheel turned at 715 r.p.m., this giving about 8½ m.p.h., but it is an easy matter with the power in reserve to turn up another hundred and get nine miles. Two twenty-gallon gasoline tanks under the cockpit seats are the Koven lead coated product which seems to be preferable to those which are galvanized on account of the lack of chemical action, for the tanks are always clean on the inside; as for the exterior, being lead, it is inclined to soil everything with which it comes in contact, but a coat of paint fixes that. An awning completes the outfit and it is not an unusual occurrence to have four generations and a graphophone from the same family spending a day on the water. The boat is surely a happy one!

It took two winters and a summer to build the boat, using only spare time, not any being taken from regular hours, and the owner considers that the bending of the ribs, which had to be steamed and placed during the short working periods, was the longest and most tedious part of the work, but after that the work was light and pleasing. He took pride in doing it.



Arrangement plan and profile of the 28-foot Idylease II

SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for July Prize Contest

1. How can one determine the power of his gasoline engine with a fair degree of accuracy from bore, stroke, and r.p.m.?

(Suggested by L.B.C., New London, Conn.)

2. Describe and illustrate a simple, practical arrangement for pumping out bilge water by means of the circulating pump on the engine, taking special care to provide for elimination of the danger of clogging any part.

(Suggested by C.E.B., Fall River, Mass.)

3. Suggest the most desirable interior arrangement plan for a 32-foot cruiser using diagrams, if necessary.

(Suggested by J.M.R., Newark, N. J.)

Rules for the Prize Contest

ANSWERS to the above questions for the July issue addressed to the Editor of MoToR BoatinG, 119 West 40th St., New York, must be (a) in our hands on or before May 25; (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' name and addresses.

The name will be withheld and initials used.

QUESTIONS for the next contest must reach us on or before May 25. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of MoToR BoatinG of which the advertised price does not exceed $25, or a credit of $25 on any article which sells for more than that amount. There are three prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer all.

For answers which we print that do not win a prize we pay space rates

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of MoToR BoatinG, of which the advertised price does not exceed $5, or a credit of $5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

How Shall I Obtain a 25-Foot Cruiser?

Answers to the Following Prize Question Published in the March Issue

"Which is the best way to obtain say a 25-foot motor boat? Buy completely equipped; buy parts and assemble; have built to order, or buy second-hand and remodel? What has been your experience?"

Choose According to Your Purse

(Prize Winning Answer)

PURCHASING a boat is entirely dependent upon yourself and your pocketbook. If you have the money and want the boat exactly to your needs you may have it designed and built to order. Put up by a reputable builder, such a boat is all that could be desired, and you can demand anything up to the best that man can produce.

If you have the money and little time, if you do not want to bother with building, or if you live a good distance from the water, or have no place to build, and still want a boat strictly to your ideas, the built-to-order boat cannot be surpassed.

But perhaps you are not as particular as all that. You want a good boat, but do not mind its having been used a bit; you have no place to build and yet do not feel as though you could afford a new boat.

No worry at all. You may get a second-hand boat that will fill the bill.

Just how good your chances are of getting what you want at the price you want to pay will depend mostly on size.

Below thirty feet boats are so much in demand that it is hard to strike a real bargain. This is especially true at this particular time.

These sizes (from 20 to 30 feet) are about what the general public wants, and so there is no real use in letting them go at anything less than the market price.

Occasionally one will find such a case as I did just a short time ago, and it pays well to watch a bit for them.

Think of getting a sound, well turned, 25-foot auxiliary, completely found, for $125.

The owner had but one leg, and being tired of depending on friends, was ready to let her go at any price. But these finds are extremely rare.

As you go above thirty feet the second-hand price on a boat falls rapidly in proportion to her original cost, and some real bargains can be found without much trouble. This is more true than ever where the first owner has had a great deal of special work and finish put in. The chances of any other man being willing to pay the price for them again are rare and often a boat of the finest construction may be had at less than half of what it would cost to build her new.

In the end, perhaps, for the man who likes to putter with tools, the best way of getting a really fine boat is to build from the knockdown frame.

Throughout the country a goodly number of firms are engaged in the business of turning out all types and sizes of boats in this form, from the 10-foot flat-bottomed dink to ocean-going yachts of close to 100 feet.

These frames are for the most part completely assembled at the factory, and then taken down to facilitate shipment.

All the machine work is done; heavy parts such as keel, stem, deadwood, and knees, are fully fitted, ribs bent to exact shape, fitted and beveled, and in short the frame finished in every detail.

It is only the matter of a few hours to bolt the heavy parts together and fasten the frames in place (each fourth or so of the latter being stayed so that it must hold its shape) of even a fair sized cruiser.

The planking is put on according to the method advised by the particular firm the frame was bought from and it is really the only tedious part of the whole thing. The ways of planking vary somewhat, but all are simple and give you a sound vessel.

The interior, and here lies the real beauty of the system, can be arranged to suit yourself in every detail; or you can choose one of the several hundred current layouts adapted to the size of your craft.

As a last word, do not get caught on the so-called standard frames. These are little more than the raw material. The ribs are bent over a few molds and all the setting up, fitting, etc., must be done by the purchaser.

Not that they are a bad thing, but for the average man they give too great a chance of not turning out a good boat unless he knows what he is about and has done some boat building before. For the experienced they are fine.

C. P., Chicago, Ill.

Buy a Second-Hand Boat

THE question brings to mind the threadbare query whether it is better to build a house or buy one ready built. If cost and time impose no limits I cast my vote without hesitation in favor of having it built to order —whether it be a house or a 25-foot motor craft.

In either case I would proceed along similar lines. I would consult an architect experienced in designing the general type of boat I required. Having arrived at the design, I would place the order in the hands of a responsible and experienced builder, stipulating that the construction be under the supervision of the architect and myself. I would insist on a time clause in the contract.

The choice of an engine would be the result of conference with architect and builder, and would be installed by the builder under supervision of architect and service department of the engine dealer. Other fittings and equipment would be selected and installed by the same method. I would lay special emphasis upon the selection of the propeller.

I would insist upon a most thorough trial trip in both smooth and rough water, with architect, builder, and engine representative present. In short, I would give just as much care and detailed thoroughness to the purchase of a 25-footer as to a 125-footer.

I have owned three motor boats, of 22, 25, and 28 feet length, respectively, and they have all been bought second hand. To all of them I have made changes and improvements, varying from minor details to the substitution of a good reverse gear for a poor reversible propeller. The engine of one boat I sent to the factory for a complete overhaul before starting on a five months' cruise. One of the boats I used six years and then sold for $25 less than she cost me. The second I ran about 3,500 miles, then accepted an offer which was $75 more than I paid for her. Owing to a serious accident, I had to take a loss of about $100 when I sold the third boat.

Having therefore had the use of a boat for about ten years at an aggregate original cost of $125, I am an enthusiastic advocate of the policy of buying second hand, provided you know something of hulls and engines, and are able to find real value in a boat which approximates your requirements as to size, speed, seaworthiness, and accommodations. If you are a New England Yankee so much the better.

Don't forget that a good boat in good hands depreciates far less rapidly than an automobile. But don't buy a second-hand boat without a most thorough examination of the hull both in and out of the water, and of the engine both inside and in operation. It is risky to buy a hull unless you know the age and the builder's name, and can get under the paint in your examination. Don't buy an engine of unknown make or obsolete model.

In regard to buying parts and assembling yourself, I would not recommend this course as an economy or unless you have plenty of time and enjoy building better than operating a boat. As for buying the completed boat ready-made and completely equipped, in other words, a stock boat, it is getting easier to get something really worth while by this means, but it is not very often that you are able to find a stock boat which meets all your requirements.

R. B. B., Larchmont, N. Y.

If You Have Patience Alter an Old Boat

THE first thing that you must decide, is just what kind of boat you want, and see, with your mind's eye, how it will look. Should you be able to find the boat finished, and at a reasonable price, buy it, but you seldom find a boat fitted to suit you. My experience was as follows: I owned an 18-foot open boat, and wanted a glass cabin, but could not find any to suit me, so looked around for something to buy and remodel. I found, in July, a boat 28 feet long and 8 feet beam, that was in fine condition, and at the price of $150. This boat had a two-cycle, single-cylinder engine installed, also a cockpit, with a standing roof over half of it. I used the boat until the fall, so that I would not lose that time in rebuilding, when I could have pleasure in boating, and started to remodel it in November.

First I contracted with a small boat builder to put on a complete cabin for me over the cockpit, out of oak, with drop windows, at the price of $200. This was 15 feet long, 6 feet 6 inches wide. Next I bought a four-cycle two-cylinder engine at $150 and installed same at a cost of about $12. My main cabin forward was 9 feet long, and my engine room 6 feet long. I also had a small toilet room on one side (as shown in the drawing) 4 feet long and 2 feet wide. I had a flush deck aft, covered with an awning, which I installed myself at a cost of about $20 and a front deck 7 feet long; the after deck was 6 feet. Decks were covered with canvas, and painted a dark lead.

Installed a generator at $20, made my own switchboard at a cost of $12, wired the boat myself at a cost of $15, and bought a battery for $20. Cushions, paints, varnish, toilet, steering gear, searchlight, and oilcloth cost $60. Total of all of the actual cost, not counting my own time, was $659 less $60, the price that I got for the old single-cylinder engine, making a net cost of $599. I had one of the best equipped boats of her length, more room than boats much larger, and thoroughly seaworthy, due to her good beam. In conclusion, I want to say that it takes a good amount of patience and work on your part, but it pays in the end, to remodel an old boat, just to your liking.

My greatest help, however, was in reading MoToR BoatinG and selecting a good deal of the outfit from the advertisements found therein.

C. G., Baltimore, Md.

Each Individual Must Judge According to His Wants and Means

THE correct answer to such a question would be different for each individual according to his wants and means.

It is possible to get a very good boat Knockdown with the plans and material to complete the outfit. This method requires a great deal of time, patience, and skill for the builder. The man who considers himself a fairly good carpenter in nine cases out of ten is doomed to failure when it comes to boat building. When the boat is completed, it will probably look like a home-made job. The builder would have to buy his motor and fittings and work out all the little details to finish up his outfit. It would require a good deal of experience to do this right. The total expense under favorable conditions would be about seventy-five per cent the cost of a complete boat and probably not a satisfactory one.

This method would be the most expensive way to get the desired boat. If a man wants a boat specially suited to his own individual needs and can afford it, this method would be the most satisfactory. It would require special plans and consequently cost more. The average man, with limited means would not feel inclined to choose this way.

By looking around, it might be possible to find a second-hand bargain that would fill the bill. In buying such a boat, it requires a pretty keen judge to make sure the boat is sound and seaworthy. Then comes the question of remodeling. This would mean more or less careful planning and the services of a boat builder. When the boat is overhauled and refitted, the expense would probably be a little less than a new boat, depending on the condition of the power plant and amount of work necessary. I have always found it is far more satisfactory in the end to start with a new outfit than to buy second hand and remodel provided there is not a great difference in cost.

There are a great variety of boats on the market sold completely equipped. These boats are tried out models. They embody the latest designs which have proved practical and popular. All the details have been carefully planned. The builders have used their best efforts to make the boats successful. Such boats are planned for quantity production and the cost is therefore much less than special models. Our average man should go over these boats and choose one which suits his requirements. He will be surprised to find he can get his boat ready made for the amount he is prepared to invest. When he buys this way, he knows he will get a satisfactory outfit. He has the builder's reputation back of his purchase. He does not have to worry how his boat will look when it is done, whether the hull is sound, or the power plant in good shape. The logical answer to his question, how can I best secure a 25-foot motor boat, is to buy completely equipped.

J. B., Oak Park, Ill.

Windshields That Are Both of Glass or Canvas

Answers to the Following Question Published in the March Issue

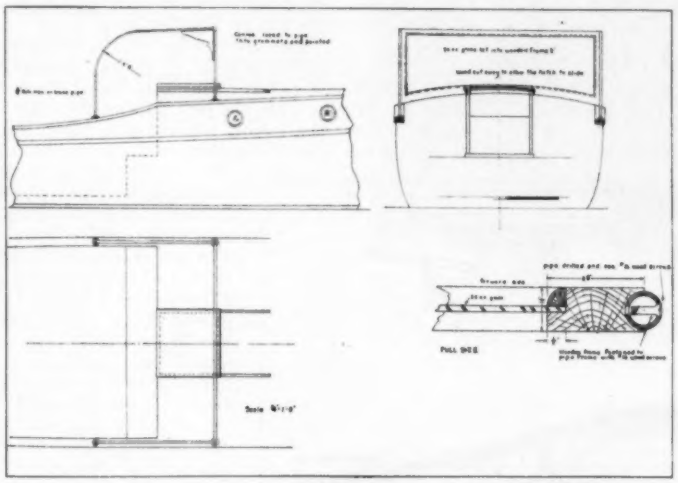
"Describe and illustrate the construction of the best windshield, glass front or other protection, for the forward end of the cockpit of a small raised-deck cruiser. Also tell why you prefer it."

A Torpedo-Chaser Model

(Prize Winning Answer)

THE type of windshield I consider the best and most serviceable for a small raised-deck cruiser is practically the same as one which has been in use for several years on the Bliss company's torpedo chasers.

Of course, the size of many of the parts depends on the individual boat, however, the general plan in each case is the same. The height of the shield should be at least 6 feet above the cockpit floor to furnish the helmsman good protection. The front of the shield consists of 1¼x2¾-inch oak, which is rabbetted ½ inch to allow the glass to fit in, as shown in Fig. 1; a quarter round molding then holds the glass in place and furnishes an easy method of replacing breakage. This is unlikely as 32-ounce glass is used. The bottom of the frame is rounded to fit the crown of the deck and is cut away just enough to allow the hatch to slide freely. The frame should be placed 2 or 3 inches ahead of the aft end of the hatch when it is shoved way forward, so that at no time can the hole cut for the hatch be left open. The sides of the shield are made of ¾-inch pipe, either galvanized or brass bent to the indicated shape.



U. L. W. combines both glass and canvas in a windshield that was found highly satisfactory on the torpedo-chasers

On each side of the frame holding the glass the pipe runs vertical and is drilled and countersunk for four 2¼-inch No. 16 wood screws. These make a good firm fastening between the front and side frames. At the top of this pipe is a 90-degree elbow and from there the pipe takes a slight bend and then runs parallel to the sheer for about 3 feet. It is then bent on a 1-foot 9-inch radius and then drops straight to the cockpit coaming. The ends of the pipe, both on deck and where it meets the coaming, are fitted with ¾-inch standard pipe flanges. The flange on the coaming can either be shimmed up to overcome the rake, or the pipe can be bent a little at the end to fit the flange.

The canvas sides are 8-ounce duck grommeted so that they can be laced tight to the pipe. The bottom is laced through holes in a cleat.—U. L. W., Greenport, N. Y.

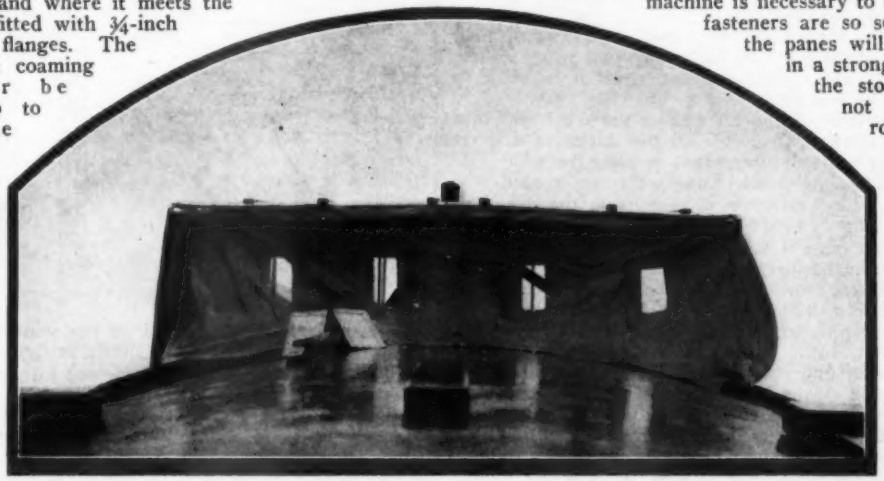
A Windshield and Storm Curtain Combined

TO be of most use on a small cruiser the device for protection from the elements must have the following characteristics:

1, The windshield must be easily and quickly put in place; 2, it must be easy to stow; 3, it must be strong enough to withstand heavy winds; 4, it must not interfere with the navigation of the boat; 5, it must not interfere with clear vision during a heavy rainstorm or fog.

The combined windshield and curtain here described possesses the above advantages. It is merely the forward curtain of a raised-deck cruiser with oblong windows cut in it; fitted to these windows are detachable panes of celluloid, so constructed that they may be put in place or removed in a few moments.

When beginning to make the shield the forward curtain was put in place and a convenient height for the windows marked with a lead pencil. As these apertures were cut the inner edges were turned back and sewn with two rows of stitching for reinforcement. The pieces of celluloid used for window panes are 2 inches longer and 2 inches wider than the windows; around their edges was sewn an inch strip of canvas, also with two rows of stitching. To hold these window panes in place large snap fasteners are used which are similar to the snap fasteners of an ordinary glove; one at top and bottom and two on each side of pane. Sockets for the fasteners are placed on the reinforced edges of the windows. These fasteners can be obtained from harness makers and must be put on by them because a small machine is necessary to do this. Such fasteners are so secure that the the panes will not blow out in a strong wind. When the storm curtain is not in use it is rolled up and held in place in the usual manner.



O. R. F. devises a combined windshield and storm curtain with removable windows so that a clearer observation may be made in a fog or rain

Removable windows have one advantage over a fixed glass windshield. When running in a fog or a heavy rain, and mist or raindrops on the pane obscure the vision, one window pane may be

removed and clearer observations can be made without discomfort.

Such a storm curtain does not interfere with ingress to the cabin through the hatchway; the hatch can be moved when the curtain is in place.

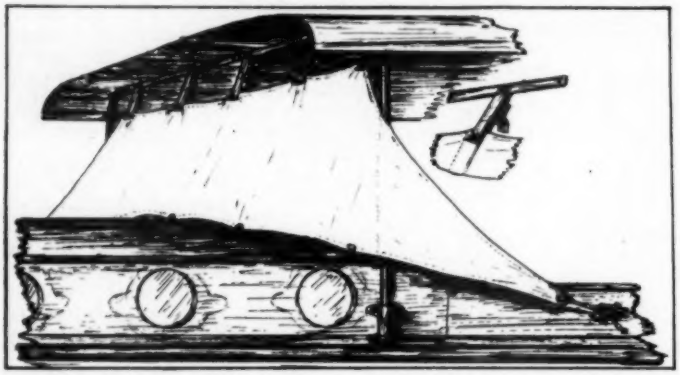
The windshield illustrated here was used during last summer on a 36-foot cabin cruiser, giving perfect satisfaction. Fig. 1 shows the appearance of the curtain when looking aft. Two of the celluloid windows are in the foreground. Fig. 2 shows the view looking forward; the windows above the helmsman's seat have been removed and one is shown leaning against the curtain. The canvas awning was removed when the latter photo was taken. It will also be noticed that strips have been sewn just above the windows as an added protection against the possibility of panes blowing out. Both Figs. 1 and 2 were photographed during a heavy rain storm.

The scheme here presented for a windshield and storm curtain has the additional advantage of being made from the usual equipment with only slight expense.

O. R. F., Brooklyn, N. Y.

A Canvas Apron Best

THE advantages of a glass windshield on a small cruiser are overbalanced by the disadvantages. If made in one piece it is bulky and liable to breakage both from boarding seas and other causes. If made in sections the supporting work must be flimsy, otherwise there is a suggestion of top heaviness.



Only in a beating rain will the man at the wheel be dampened with this canvas apron of J. E. M.'s in use, and then not enough to be disagreeable

Being near the surface of the water a glass windshield is often rendered useless with salt spray just when its use is most desired. The rapidity of motion often causes it to be a mirror to the helmsman.

Hence, the writer uses on his cruiser the wind and rain apron here illustrated. It fulfils all the duties of a glass shield with none of its disadvantages and has the added advantage of being easily stowed away when not needed.

The method of construction is seen from the drawing. Eight-ounce canvas is best adapted for the work. As will be seen the upper edge is fastened to the pipe awning with straps as shown in the insert, while the bottom edge is fastened to the cabin roof with snap hooks engaging screw eyes.

Celluloid was first used as a topping, but it scummed over in rainy weather and became salt incrusted with spray in sunshiny weather, so it was discarded. Only in driving rains will the rain find its way to the helmsman and then by shortening the straps the amount will be almost negligible. The wind, too, is deflected by the slant of the canvas. If the helmsman wears the conventional yachting cap, adjusts the apron so that the upper edge is practically on a level with the vizor, it will be difficult for him not to imagine that he is behind a glass windshield.

J. E. M., New London, Conn.

A Windshield that Can Be Tilted to Any Angle

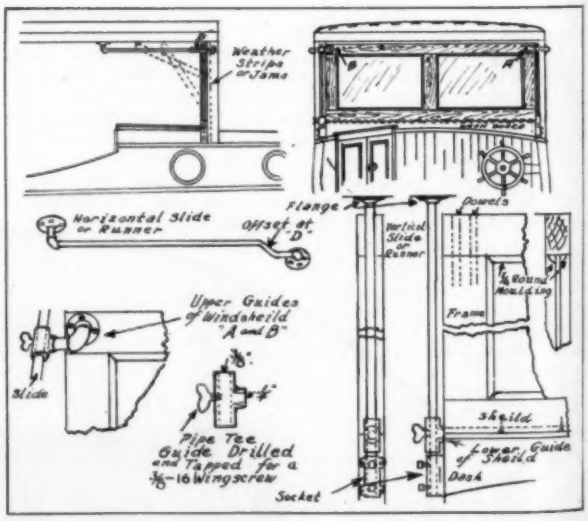
A VERY simple and practical windshield for the front end of a small raised-deck cruiser can easily be made by carefully following these instructions and drawings.

The first step is to fasten weather strips or jams against the front awning supports and across the top of the awning from post to post. Then across the deck from post to post make a dash-board, preferably of 1-inch oak, so that the windshield when down rests on the dash-board and against the jams or weather strips.

The windshield frame is made from the same size stock as the dash-board. If a mortise and tennon joint proves too hard to make, a good solid joint can be made with the use of ½-inch dowel pins as shown in the sketch. The windshield frame should be made to the size representing the space between the awning supports, the dash-board and the top jam or weather strip.

The lower edge of the windshield should be gouged out so that a piece of ¼-inch iron pipe will lay in it to half its diameter. The dash-board edge should also be gouged out to clear the pipe so that the edge of the windshield and the dash-board form a good tight joint. The shoulder against which the glass lays can be cut into the frame if the tools are handy, but ¼-inch round molding answers the purpose as well and requires less skill to make.

The runners, or slides, and guides for the windshield are made from ¼-inch pipe and fittings. The upper, or horizontal, slide is made as shown in the sketch by the use of two flanges, two elbows, and a length of ¼-inch pipe offset at D to clear the up and down, or vertical, slide. This should be made long enough so that the windshield can be slid back its full length. The rear flange should be fastened to the top of the awning frame and the front flange should be fastened to the side of the awning post. The vertical, or up and down runner or slide, is also ¼-inch pipe fastened at the top with a flange to the awning frame and at the bottom to the dash-board by means of a socket such as is used on detachable canopy tops for small open launches.



(At right) J. C. H.'s windshield can be tilted to any angle affording whatever ventilation desired and when down in position affords maximum protection against wind, sea or rain. When slid back it is entirely out of the way

The upper guides at A—B on the windshield are made from ¼-inch pipe fittings as shown in the sketch, with the exception of the T, which is a ⅜-inch fitting with a ¼-inch offset. This ⅜-inch fitting will allow it to slide back and forth over the ¼-inch pipe runners. These fittings should be made up good and tight with the exception of the T which should rock or turn snugly on its thread. The guide at the bottom of the windshield is also made of a ⅜-inch T with a ¼-inch offset fitted on the ¼-inch pipe on the bottom of the windshield.

J. C. H., New York City.

Changing an Outboard Motor into an Inboard

Answers to the Following Question Published in the March Issue

"Illustrate and describe in detail how to alter an outboard motor into a successful inboard motor for installation in a light skiff"

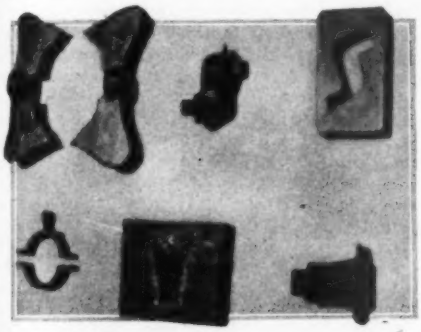
Can Be Done at Negligible Expense

(Prize Winning Answer)

TO anyone at all familiar with motor construction the accompanying sketches and photographic illustrations will be practically all that is needed to carry out the work of altering an outboard motor into a successful inboard power plant.

From the patterns here pictured two sets of castings have already been made and two former outboard motors whose business ends had come in contact with hidden rocks and sunken stumps with dire results to the outboard parts, are now operating with absolute satisfaction as inboard motors.

The patterns were all home-made, amateur fashion from clear soft pine, an extremely sharp knife, some fine sandpaper, black shellac, and a little care being about all that was required in getting them out. The castings for the principal pieces are all made in brass and cost but $3 for each set.



From the home-made patterns of C. E. B. castings were made, using parts of outboard motors which had been damaged by rocks. They are now undamaged inboards

The work on the castings, except for the filing up true of the different faces, consisted of simple boring and drilling operations. This work we were perhaps fortunate in obtaining gratis from an appreciative chap whom we had favored on several occasions last summer with a number of real successful fishing trips and who by the way we have since (during the last season) been able to start into building a little craft of the Jingo-type all his own. The ¼-inch ball check valves required for the pumps in each case cost sixty-eight cents at the local supply house and each spark plug with priming cup attached added another $1.25 to the bill.

The remaining incidentals were for the most part picked up from the accumulations of the scrap box and worked into advantage. The most actual trying work consisted chiefly of carefully brazing the supporting lugs to the brass crankcase in the manner shown, and affixing the timer as indicated. The fitting of both manifolds and assembly of the pump was work of the simplest character while the flywheel was turned out from a cast-iron flange of suitable size.

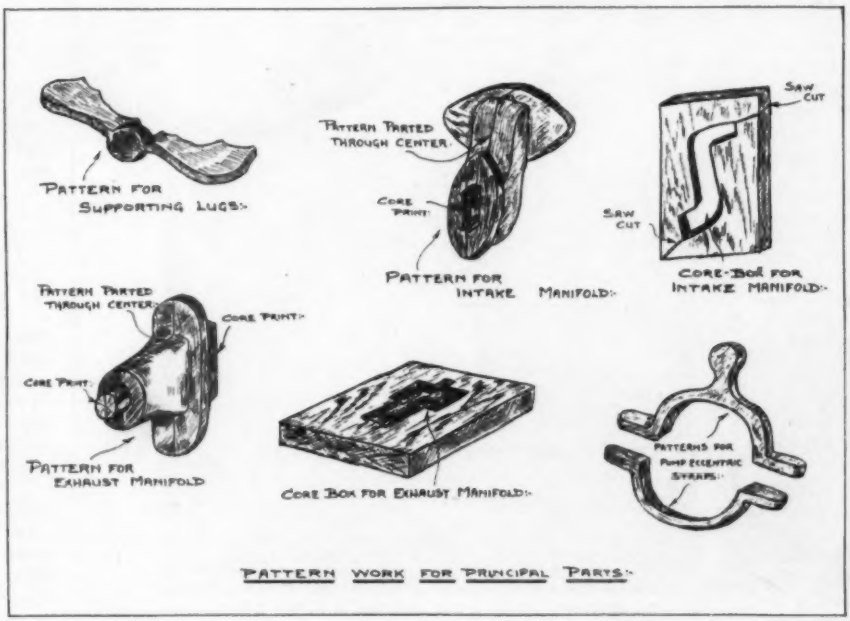
The cylinder, flywheel, and crankcase were all given a coat of flat black paint, rubbed lightly, varnished with two thin coats of spar varnish; the result was amazing

With the completion of the work a rigid bed was constructed in the cellar and the motors both run continually for lengthy periods. With all adjustments completed to satisfaction the motors were partially dismantled, the cylinder casting filed fairly smooth and the pores of the iron filled with iron filler. The cylinder was then given a coat of flat black paint rubbed lightly, varnished with two thin coats of spar varnish and rubbed down to a finish that resembled a new auto.

The crankcase and flywheel were also treated in a like manner excepting the rubbing which was omitted on these parts. The brass work was finally all smooth-file finished and polished with a fine emery cloth and latterly shined up with brass polish to an outstanding contrast with the black castings.

The motors are both creditable jobs, small, of course, but all that is to be desired for a small light skiff or tender for use on short runs. Should you like further detailed information regarding any part the writer will be pleased to forward same upon receiving inquiry addressed through the magazine.

C. E. B., Fall River, Mass.



The patterns were home-made from clear soft pine using an extremely sharp knife, some fine sandpaper, black shellac—and a little care

Machine Work and Addition of Parts Necessary

WHEN considering the alteration of an outboard motor so as to adapt it to an inboard installation, it is well to think twice before starting the work. A certain amount of machine work will be necessary and some new parts must be added and, unless one is equipped to do this work himself, the change may prove more expensive than if an entire new motor and outfit were purchased.

It is rather difficult to give sketches and a detailed description of just what to do, inasmuch as the various makers have different methods of construction. In a general way, the following changes will be necessary. A new gasoline tank with piping is needed. The position of the mixing valve has to be changed so that it will be vertical when the motor is vertical. A new water pump is very often necessary and this must be mounted so as to operate from the end of the crankshaft. A new propeller shaft with coupling and an outboard stuffing box bearing are needed and with some motors it may even be necessary to get a new propeller. A thrust bearing is required on the shaft just back of the motor. Exhaust piping is needed as well as connections for the cooling water. Most likely the crankcase has no flanges or other means by which it can be bolted to a foundation so that provision must be made for this.

Remove the gasoline tank, the muffler and connections and the brackets that clamp the outfit to the boat. Next disconnect the propeller shaft housing where it is attached to the crankcase. In most cases, the housing and shaft can now be drawn from the end of the crankshaft, leaving the motor as a separate unit. The next thing is to make brackets out of half-inch iron bent in such a way that they can be securely fastened to the crankcase and, extending out from the sides at right angles to the vertical, serve as flanges to be bolted to a foundation. Their particular shape and method of fastening will depend on your make of motor.

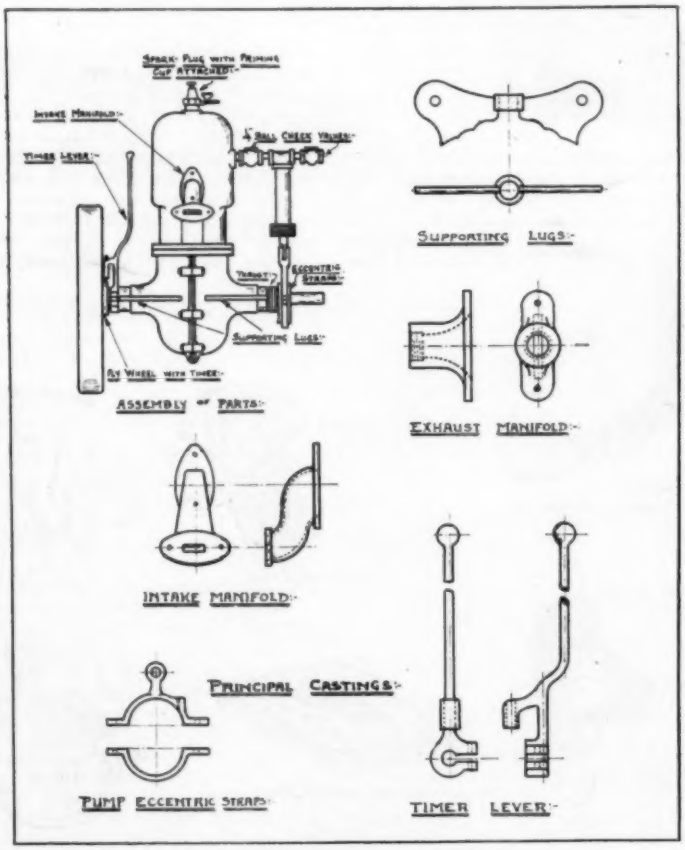
If the spark control is not arranged so that the motor can be made to run in the opposite direction, it will be necessary to purchase a new propeller, the reason being that the propeller and crankshaft run in opposite directions in the outboard arrangement because of the bevel gears. A new shaft of the proper length with a coupling on one end to connect to the crankshaft and the other end fitted to take the propeller is necessary. An outboard stuffing box bearing for the shaft must also be bought. Get a thrust bearing and a collar to fit on end crankshaft to take up thrust from the propeller.

It is hardly feasible to try to use the old water pump as it is usually incorporated in the housing back of the propeller so that it is not easily adapted to another location. A pump of the plunger type can be had that will work on an eccentric attached to the rear end of the crankshaft or you can get a rotary pump and drive it with gears. It should be fastened to brackets securely attached to the crankcase and then connected by tubing or a heavy piece of hose to the water inlet on the cylinder.

The thrust bearing can run between the end of the rear main bearing of the motor and a collar pinned to the shaft by a taper pin. This thrust bearing and collar must be carefully fitted as there should be very little if any end play, otherwise it will not fullfil its purpose of taking the propeller thrust.

The mixing valve will have to be turned at right angles to the old position so that it will be vertical. To accomplish this, it may be necessary to get a new flange connection, unless the old flange screws into the mixing valve, in which case it can be given a quarter turn.

A. L. M., New York City.



According to A. L. M., a new gasoline tank with piping, a new water pump, a new propeller shaft with coupling, an outboard stuffing box bearing, a thrust bearing and possibly exhaust piping and connections for cooling water, as well are necessary

Why Do It?

THE value of the outboard motor for driving the tender has been repeatedly demonstrated, and for the tender of an average size cruiser all arguments are for it as against the small inboard motor. It is possible to convert an outboard motor to the inboard type but, why do it? Practically everything about the motor must be changed and a part of the equipment will need to be replaced by a different type part. A special motor foundation so constructed that the motor could be fastened down with the original clamps will be necessary, or brackets would have to be bolted to the crankcase in order to fasten the motor down in the usual manner and the alignment of a motor so bedded would be exceedingly hard to maintain. You could not expect any less vibration and a separate fuel tank would have to be provided.

The cylinders and the crankcase, including their bearings and interior parts of the motor are about all that could be used to advantage and of the accessories the ignition equipment alone is all that is usable without alterations. On most outboard motors the circulating pump is located in the water. This would have to be relocated or replaced and a special drive provided in order to use it on an inboard installation. The mixing valve or carbureter flange would have to be turned or a new flange provided in order to keep the carbureting device in a vertical position.

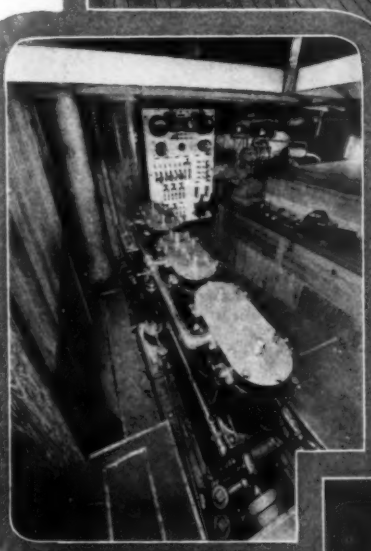
The oil holes in some outboard motors are in the proper position for a horizontal cylinder but will the crankpin get sufficient lubrication when the cylinder is set in a vertical position unless additional holes are drilled in the connecting rod?

For an inboard installation a shaftlog, stuffing box, and a rudder must be fitted to the boat besides the engine bed.

W. B. M.,
Newburgh, N. Y.

Elise II, An 88-Foot Auxiliary Schooner

Elise II is a three-masted auxiliary schooner designed by Bowes & Mower, of Philadelphia, and owned by Commodore Frank B. Bower, of Philadelphia. The view at the left shows the forward deck and standing rigging of Elsie II



Commodore Bower, owner of Elise II, at the wheel of his 88-foot schooner

Photographs by Pearce

The power plant of Elise II is one six-cylinder Standard motor, having a 6-inch bore and 8-inch stroke. Under power alone the boat has a speed of about 7 knots

One of the features of Elise II is the immense amount of room below decks and her spacious accommodations for the owner and his guests. The designers made good use of every bit of her 20 feet of beam

Two Men, a Maid and a Boat

Boojum Breasted Bounding Billows on the Bay or Sped Through Sea and Sound Submerged in Spray

By L. Maguire

PART II

(Continued from April Issue)

As we were dressing a little fish poked its head out of the water, gave dirty Bayard the O. O. and "Come on in, the water's fine," said he. Bayard hesitated. but Massachusetts Bay was calling and we needs must go.

It was a fine, clear day and after putting in gasoline we hastened out of the harbor, striking Massachusetts Bay at 6:30. Forgotten was the gloom, disgust, and weariness of the previous night. With the peaceful blue water of the bay stretching away before us, a brilliant sunlit sky above, cool refreshing breezes and we were again singing "Heigho for the Bounding Billow!"

The exhausted alcohol had not recuperated over night and in consequence it took almost two hours to cook the breakfast. Indeed, the cooking on this trip was no joke. The stove, a tiny one, had room for one pot only, and the cook when cooking must give it close attention to keep the pot from bouncing off. Our dishes, pots, food, etc., we kept in canvas-covered boxes. The cook invariably occupied one box, the stove another, and, *of course*, the things needed were always in one or the other of the boxes, so that there was a constant shift both of the stove and the cook.

Fortunately for this long drawn out breakfast the going was smooth, no wind at all and the water like glass. We shut down in the middle of the bay while we changed the batteries. I had a good opportunity to study the species porpoise for two great playful fellows cavorted within ten feet of the boat.

We struck a bad chop in Cape Cod Bay and it grew worse as we approached the mouth of the Canal. Near the entrance it was so bad that we had to throttle down the engine and creep in behind the breakwater.

Either the passage of a boat through the Canal was unusual or Boojum and crew were a rare sight, but at both bridges passing automobiles and pedestrians stopped in their tracks to gaze at us.

The sun was low in the sky when we left the Canal waters and ran out into Buzzards' Bay and thence into the peaceful, sheltered harbor at Onset. We found anchorage near a tiny island, dressed and went ashore to buy alcohol. Onset proved to be an attractive, if somewhat noisy summer resort, with a Coney Island look to it. Its main street was lined with popcorn and frankfurter stands, shooting galleries and post-card booths. Afar off we could hear the squeeky strains of a merry-go-round organ; and the roar and rumble of the scenic railway.

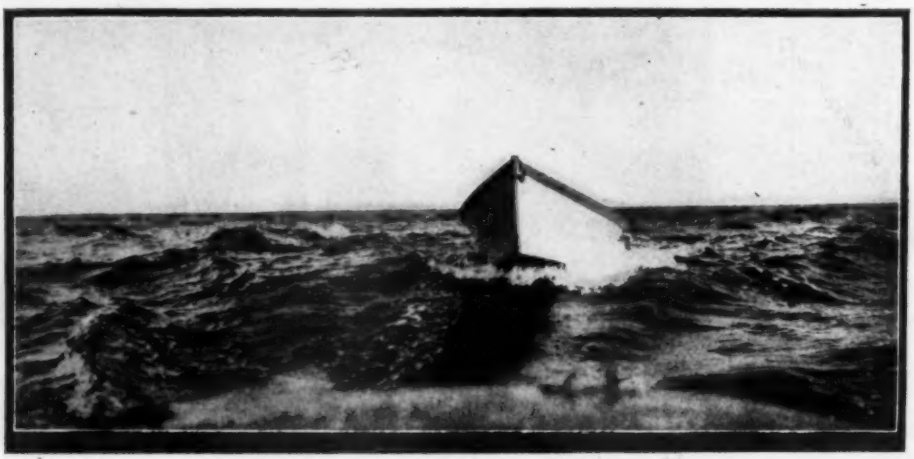
On our way back to the boat we got lost and after wandering about on the dark water front for a half-hour we finally found our small boat Seive, made Boojum and went to bed. About midnight we were awakened by rain pouring into the cockpit, and there was a hasty scramble for oilskins and canvas to make up for the deficiencies of our all too short khaki top.

About 5:30 we rose, had a swim and breakfasted leisurely in the quiet little harbor. Later, Bayard built a steering platform. Hitherto I had had to stand up while steering, but two or three pieces of wood, a few nails, a little hammering, and we had a comfortable seat high enough to enable me to look well over the cabin top.

It was 9 o'clock before we got under way with a favoring tide but with the wind against us. We rolled and tumbled pretty badly as far as New Bedford, and I must confess that I was badly frightened by the plunging of the boat. Gritting my teeth, however, I kept her nose into the sea, expecting each wave we struck would swamp us. Buzzards' Bay is not particularly good sailing ground. Its shallow, ledge-strewn waters are seldom calm, and for long stretches its rocky floor may be plainly seen a few feet beneath the surface. Near New Bedford, however, deeper water made smoother going and our shattered nerves got thirty minutes respite before we struck open water and a heavy sea. Completely exhausted with the struggle to keep the boat from turning a sommersault, we were ready to quit by the time we reached Sakonnet Light. Running in behind the breakwater that protects the mouth of the Sakonnet River, we got our lunch. While we were anchored here we saw a school of tiny fish. Out of the water they jumped, very close to the boat, hundreds of tiny silver flashes. We got our camera ready, and then, of course, they refused to perform.

On a nearby sloop several visitors sat around and stared us out of countenance, my pants, no doubt, the cause of their interest. Audible, detrimental remarks from Boojum having no effect, we levelled our binoculars upon them and they began to squirm under our steady gaze. Meanwhile, two fat men aboard the sloop struggled valiently to get her under way. With much work and more talk they

(Continued on page 96)



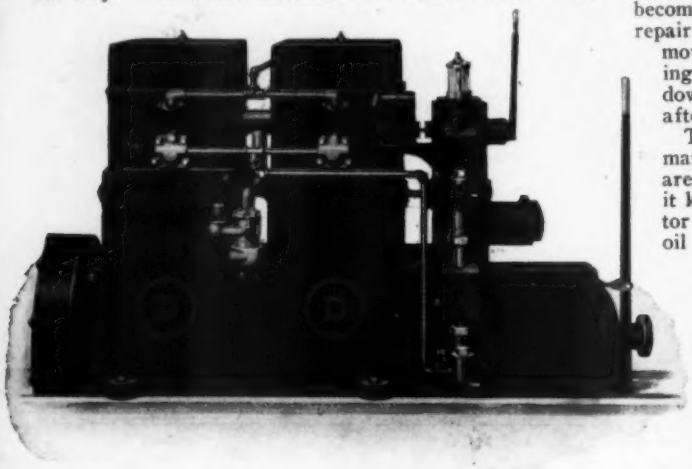
A tiny boat on a vast sea and while the motor continues to behave you are monarch of all you survey

Moonlight nights along the New England coast were made for fairy princes and princesses. The beauties of land, water and sky blend into the fairyland of dreams

AMERICAN MARINE MOTORS

A New Line of Four-Cycle Motors

THE Delaware marine motor manufactured by the Delaware Marine Motor Co., of 2 Commerce St., Wilmington, Del., has been designed for economical operation and maintenance; clean, silent and always ready for duty. This motor has been built with the idea of saving space in engine-rooms where usually much is lost and with that in view the motor is constructed so that practically every part is accessible from one side.



Delaware marine motors are in three sizes—two-cylinder, 20 h.p.; four-cylinder, 40 h.p.; six-cylinder, 60 h.p. These are medium-duty motors with heavy-duty reliability built in. They are for runabouts, cruisers, and work boats. They are absolutely accessible in every part

By removing only the cover plates, every moving part from crankshaft to water pump and air pump eccentrics becomes immediately accessible for inspection, adjustment, repair or replacement. When the crankcase cover is removed the connecting rods can be uncoupled by loosening two bolts for each rod. Any piston can be dropped down and withdrawn without the slightest difficulty, after the connecting rod is uncoupled.

There is not a single exposed part on the Delaware marine motor. They are not merely covered up, they are enclosed in a case that keeps oil and fumes in while it keeps dirt and grit out. The completely enclosed motor insures clean and easy lubrication, because neither oil holes nor grease cups are used at any point. The cylinders are cast in pairs, have ample jacket space and serve as support for the camshaft. The cylinder heads are removable. They have water space completely surrounding all valve passages where hot gas comes in contact with the iron. Pistons are made of the finest gray iron. McQuay-Norris leak-proof piston rings are used. Connecting rods are of high tensile manganese bronze, as strong as steel. The crankshaft is of forged carbon steel accurately and smoothly machined. The flywheel is fastened on with a taper and key. Timing gears are very heavy and rugged; steel to bronze. They are accurately cut, silent and long-wearing. The Carlyle-Johnson reverse gear is built into this motor. Its installation inside of the crankcase assures continuous lubrication at all times without impairing its accessibility.

A Motor for Commercial Craft

OUT on the Pacific coast where the motor-driven commercial boat has come into its own and where the commercial fleet has been developed to a state of perfection found in hardly any other locality the gasoline and distillate engine has made an enviable record. It is here that the efficiency and reliability of marine motors is quickly appreciated.

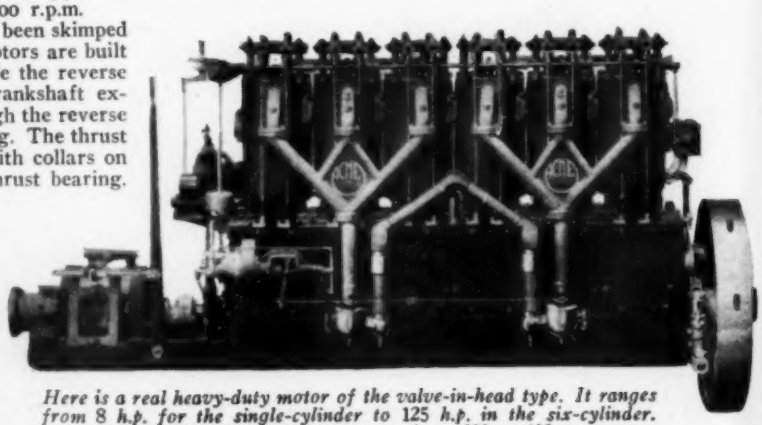
Under these conditions it is only natural that the medium- and heavy-duty motors are universally used. The light, high-speed motor has not stood the test of actual service. One of the best known and widely used motors on the coast is the Acme, built by the Acme Engine Co., of San Francisco, Cal. These are real heavy-duty motors ranging from 8 h.p. for the single-cylinder up to the 125 h.p. six-cylinder machine. They are all of the heavy, slow-speed type, developing their rated power at from 300 to 400 r.p.m.

Like all heavy-duty motors, material has not been skimped at the expense of serviceability. All Acme motors are built with the bed plate or base extended to include the reverse gear. Another special feature is that the crankshaft extends from the flywheel all the way back through the reverse gear and into the tail shaft in the thrust bearing. The thrust bearing is of the marine steam engine type with collars on the tail shaft which run in grooves in the thrust bearing.

The bed plate, frame or upper crankcase, cylinders, and cylinder heads are all cast separately of close-grained gray iron. The crankshafts and connecting rods are forged from solid steel billets of high tensil strength. Each billet is tested by Lloyds Agents according to the rules of Lloyds Register for marine shafting. Both the upper and lower bearings of the connecting rods are adjustable. The upper bearing is of phosphor bronze while the lower bearing as well as the main crankshaft bearings are of a special plastic bronze, easily removed and interchangeable. No babbitt is used.

These motors are of the valve-in-head type, with extra large valves with wide seats. The valve guides are a separate casting fitted into the cylinder head and easily removable. The water enters the cylinder heads from the cylinders by means of outside by-passes, thus allowing the use of a copper cylinder head gasket that will not leak.

All Acme engines are fitted with Schebler carbureters, the air intake being piped to a hot air sleeve on the exhaust manifold, thus providing for operation on kerosene or distillate as well as gasoline. Either make-and-break or jump spark ignition can be supplied. In either case a gear-driven magneto is used.



Here is a real heavy-duty motor of the valve-in-head type. It ranges from 8 h.p. for the single-cylinder to 125 h.p. in the six-cylinder. They develop their rated power at from 300 to 400 r.p.m.

Safety Suits That Really Save At Sea

Preservers Perfected Under Pressure of Prussian Peril—Garments Devised to Afford Protection from Exposure As Well As to Keep One Afloat

By Harwood Koppel

HAD it not been for the urgent demand created by the war for a life preserver that would really do what its name implies it is extremely doubtful if the evolution of the life saving devices and suits which have in the last year or two been perfected, would have come into actual use in any number for many years yet. The public, always loath to accept a new invention or even an innovation on an accepted device of any sort, until it has been shown, was given such demonstrations that there was little left to ask for by the men from Missouri.

With hundreds of thousands of our best boys being sent overseas on transports menaced day and night by the lurking U-boats and with other thousands sailing the seas on the ships of the Navy, the Government was placed in the position of safe guarding their lives in reality and not in theory. For the thousands of years that men had been navigating the waterways of the world there had always been some attempt at having on board vessels life saving appliances of some sort for an emergency, but the best thought of the men most capable of devising efficient means of life saving devices had not been given to the subject and so for years and years men had been going out to sea with nothing better for their protection than the cork device, by courtesy called a life preserver. It is true that under certain circumstances the cork devices would keep a man afloat on the surface of the water, but there were other times when they kept him afloat, it was true, but with his head down and his feet in the air. This, then, was not always a life preserver, but in reality it would better have been termed a body saver. Again, unless cork devices were constantly looked after they rapidly deteriorated and crumbled into bits while the cloth in which the cork was confined rotted away.

Hence, with the incentive of the many lives being lost through the torpedoing of vessels by the German submersibles it became imperative that a device of some sort be constructed that would actually save lives at sea. One of the strongest objections to the cork jackets was that even in the instances where they did sustain a person on the surface they afforded no protection from exposure. It offered little consolation to a man to know that when his ship sank he would be supported on the crest of the waves, if his vessel was going to sink in the North Sea in the dead of winter, where exposure to the cold water and the icy winds meant death in a few hours or perhaps a few minutes—after intense suffering.

With this idea in view practical men began working on a suit that would not only sustain a man on the waters but preserve him from exposure as well. That they eventually succeeded in devising such a suit is best attested by the official Government reports and recommendations on the subject. One of the strange coincidences was that several suits combining almost identical features, but differing somewhat in structure and composition, appeared almost simultaneously. All were so good that it is not for a layman like the writer to attempt to pick the best, and so this article shall be confined simply to a description of the various suits devised, as described by the men who invented and manufactured them.

Photograph by Conral News Photo Service

In all of them Kapok is the ingredient that gives the element of buoyancy to these suits. For that reason there is no danger if the suit is punctured, because Kapok will not readily absorb water. Since the suit does not depend upon air for its buoyancy, it will float no matter how many punctures it may receive. This Kapok is a water-proof vegetable fibre, which comes from Java and the Straits Settlements, and is five times more buoyant than cork. It will keep the wearer afloat indefinitely, entirely independent of the rubberized garment, and if the latter were torn to shreds, leaving only the Kapok padding, the wearer would still have a life preserver that is more efficient than

The various safety suits are without complex features—easily and expeditiously donned and one may float around on the water with one's head free almost comfortably

any device I know of which depends solely upon the air.

THE DREADNAUGHT SAFETY SUIT

"THIS garment," said its inventor, "is impregnable to both water and the atmosphere. It is non-metallic, with a simple effective closure with no frames, draw strings or mechanical contrivances. It is made of flexible rubberized material of the best quality. The collar and wristlets are of elastic rubber, adjustable to any size neck and wrist. The soles are of pliable high-gravity rubber, and the snaps and buckles are of rust-proof metal.

"Its buoyancy is indestructible. The garment is fitted with a detachable padded lining of silky fibre kapok, of the same sort that the Government uses in its life preservers. The lining can be used separately, as it is in the form of a jacket with buttons inside of the suit. This jacket is of sufficient buoyancy to support not only the wearer but several other persons as well. A leak is impossible. The suit is molded and vulcanized into a one-piece garment and is manufactured exclusively for our company under our patents by the United States Rubber Company.

"The suit acts as a thermos bottle for the body, and the natural heat radiating from the body is stored up and retained. It is equipped with a cap a pocket for carrying food and a whistle to summon assistance or designate the wearer's location in the water in darkness or fog. There are also extra rubber mittens to protect the hands. It requires less than a minute to adjust completely and may be put on over the regular clothing. There is no delay or confusion. When not being worn it makes a small bundle that can be conveniently carried, the complete outfit weighing fourteen pounds and measuring 18 x 12 x 7 inches. It requires much less space than is taken up by the ordinary cork life preserver. It comes in all sizes for men, women and children, large, lean, tall or slim."

moment, close the suit by means of two clamps attached in a convenient position in front, snap the safety lock and plunge into the water, where he or she will float in an upright position, head and shoulders well above the water. A lead sole in the bottom of each shoe of the suit keeps the wearer in this upright position, even if exhausted or unconscious.

"The suit does not depend for buoyancy upon the air that may be confined within it. The upper portion of the garment is lined with a special composition of kapok, which has five times the buoyancy of cork and which also adds to the warmth.

"The suit is made of very strong material, not easily punctured; but punctured or damaged, it will retain its buoyancy, because the special composition will not absorb water. While water, in case of puncture, might fill the suit as high as the waterline, tests have proven that the heat of the body will take the chill from the water in the suit and largely protect the wearer from exposure, while, at the same time, the buoyant padding will prevent all possibility of drowning.

"There is a water-proof pocket conveniently placed in front, large enough to carry a canteen with fresh water or liquid food sufficient to last forty-eight hours. A whistle is at hand to help attract the attention of relief boats and rescuers, or to signal one's location to others in darkness and fog.

"The Ever-Warm safety suit is made in different sizes and can be worn by man or woman. The fit, however, is not essential, as the suit is easily adjustable; a small person can wear a large one if necessary. It is light in weight, easy to carry, and is packed in a suitcase or canvas bag. With ordinary care it will last many years."

The combined kapok and balsa jacket above and the kapok suits on the right and left are all designed with the idea of giving their wearers freedom of movement while insuring the maximum of safety. Women wear them as comfortably as men. They are of negligible weight and in the water sustain one indefinitely

THE EVER-WARM SAFETY SUIT

HERE is the inventor's own description of the Ever-Warm safety suit, which was designed by him to save and protect its wearer in water anywhere, at any time, under any conditions:

"The Ever-Warm safety suit," he said, "is made in union style, with shoes and mittens all in one piece, completely enclosing the body, excepting the head, in a water-tight suit of a special quality of absolutely water-proof material. The head is protected by a water-proof cap.

"It is so simply constructed that you can slip it on in less than a minute without any assistance, and many have put it on within fifteen seconds. You do not remove your shoes or any of your clothing. Any man, woman or child can step into the suit clothed just as he or she may be at the

UNIVERSAL LIFE SAVING SUIT

"THIS suit," said its inventor, "is made of double texture with rubberizing between the fabrics, the Universal Life Saving Suit thus is constructed to prevent the water-proofing from wear and from readily being punctured. The sections are first sewed together, then all seams are cemented and strapped and are reinforced at all points of unusual strain or wear, such as ends of fingers, heels and crotch. The suit is next vulcanized, making it practically a seamless garment that will not come apart under any atmospheric conditions. The rubber used in these suits is of the best grade. The feet are weighted with flexible metallic soles weighing two pounds each. The total weight of the large size suit is seventeen pounds and the medium size fifteen pounds.

(*Continued on page 74*)

My Ideal Auxiliary

No. 4, Drift—A 20-Foot Sloop

By W. D. Reinhard

The "My Ideal Auxiliary" Competition is open to every amateur of the country. There are no other restrictions and no limit to the size or type of the auxiliary which the designer may choose as his "Ideal". Designs may be submitted any time up to June 1, 1919, but the earlier they are received, the better chance the designer has to have them published. The plans should be complete and include outboard profile, arrangement plans, sections, construction, details, lines, and a table of offsets. A description of not over 2,500 words should accompany the plans.

For each design published we will pay $35 and to the winner of the series will be presented $65 worth of boat merchandise of the winner's choosing. MoToR BoatinG's subscribers pick the winner.

A BOAT of light draft, large enough to carry a party of eight or ten and to accommodate two or three over a week-end, were the principal requirements in mind when the plans for Drift were drawn. It was also desired to design the boat to permit grounding at low tide occasionally, where she would be exposed to breakers.

In order to do this the hull must rest on a fairly even keel when aground, otherwise the sea is likely to swamp her as the tide rises.

Other requirements were to make use of the Long Island breezes—hence she's a sail boat; incidentally equipped with power, graceful in appearance, speedy under either sail or power and finally, inexpensive.

The size chosen is a 20-foot sloop having a low cabin, affording four feet three inches headroom. The size of the cabin is small indeed but large enough to bunk two and possibly a third, comfortably for several nights.

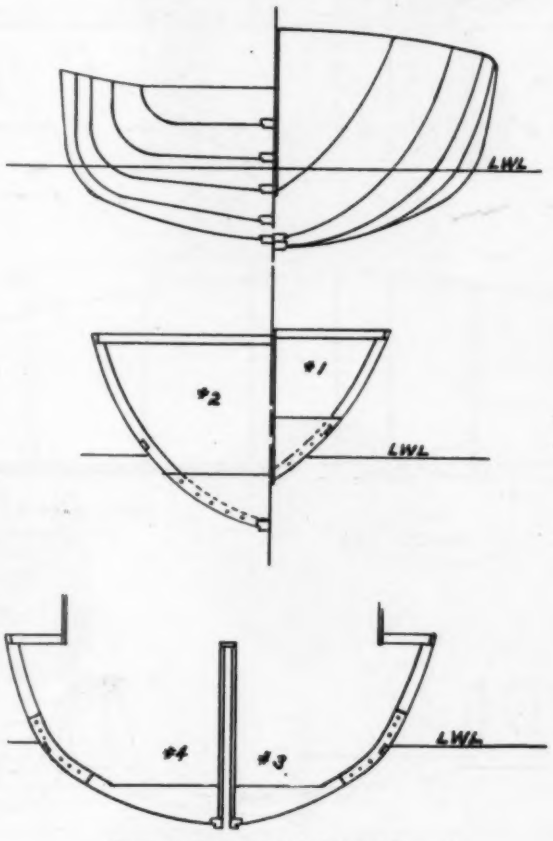
The centerboard, to be weighted, extends to within 15 inches of the back of the cabin, the object being to permit the gangway in a central position, which is necessary as it permits accessibility to starting the engine. The bulkhead at section six is solid, minimizing the odors from the engine which usually occupy a small cabin. The power plant is a Gray Model U, 3-h.p. motor, swinging a twelve-inch wheel. This engine was chosen because of its compact form and fuel consumption, also because 3 h.p. is plenty for a boat of this type. A speed of eight or so miles might be expected as the engine will turn at 900 r.p.m., turning a three-bladed wheel 12 x 16 inches.

The fuel tank is to be of twenty-five gallons capacity and located under the rear cockpit seat, thereby keeping the gas away from the cabin.

SCALE $\frac{1}{2}$" = 1 FT.

TABLE OF OFFSETS IN {FEET INCHES EIGHTS}

	STATION	STEM	1	2	3	4	5	6	7	8	9	10	T.
HEIGHTS.	TOP OF SHEAR	400	3100	384	370	354	340	334		320	310	304	300
	TOP OF CHINE		204	184	163	156	160	164		190	200	234	274
	BOTTOM OF KEEL		010	020	000	000	000	007		060	104	174	230
HALF BREADTHS	SHEAR		230	336	3102	400	400	3111		373	333	2110	260
	CHINE		130	250	307	354	370	384		361	330	2107	256
	KEEL	010	020	030	030	030	030	030		030	030	030	030



Sections Nos. 1, 2, 3 and 4 and lines of Drift; Scale: 5/16 inch equals one foot

The cockpit is to be self-bailing, for reasons best known to anyone who ever had anything to do with small boats, the floor to be above the top of the cylinder head and provided with a flush hinged hatch. Either a wheel or tiller handle may be used to steer by, but a handle calls for a less expensive, simpler and more practical outfit for a boat of this type.

Don't misunderstand me by concluding a party of eight or ten is to be entertained in the cockpit—nothing doing, we're out for air.

How many boat owners have ever taken out a few friends when at least half of them didn't stroll forward and camp out on the cabin roof? For the convenience of these few, including myself, the deck is made a foot in width, providing a foothold at the expense of room within.

The materials entering her construction are oak and pine. The keel is to be of oak, one piece, 2 x 6 inches, extending from the transom to the junction with the stem. The stem, also of oak, to be 2 x 4 and properly babbitted. The ribs space on 2-foot centers, with the exception of those in the vicinity of the engine, are to be of 1 x 2-inch oak as shown in plans. Where space is not desired and the rib is out of the way, such as number 8, the inner edge is straight, to save time and unnecessary work in her construction and as weight is needed for ballast, her size is immaterial.

The planking is to be of white pine, 1½ x 2 inches, fastened every foot with wire nails 3 inches long. Fastening in this manner, makes an extremely rigid construction for thin hulls. The usual method of fastening will, of course, be used, employing galvanized fastenings. The decking and cabin roof are to be of ¾ x 3-inch pine. The coaming, forming the cabin sides is to be of oak ¾ x 15 inches, if that width is obtainable. All

flooring bulkheads, lockers, berths, and centerboard are to be of white pine.

You will notice the rather full lines of the bilge which keep the hull on an even keel when aground. The displacement of the bilge is not great enough to sink the hull to the waterline, therefore necessitating the addition of weight in form of ballast which is needed, as anyone can see by glancing at the sail area. This additional weight, which is to be determined when the hull is launched, can be carried under the flooring near the keel, the entire length of the keel; preferable of cement.

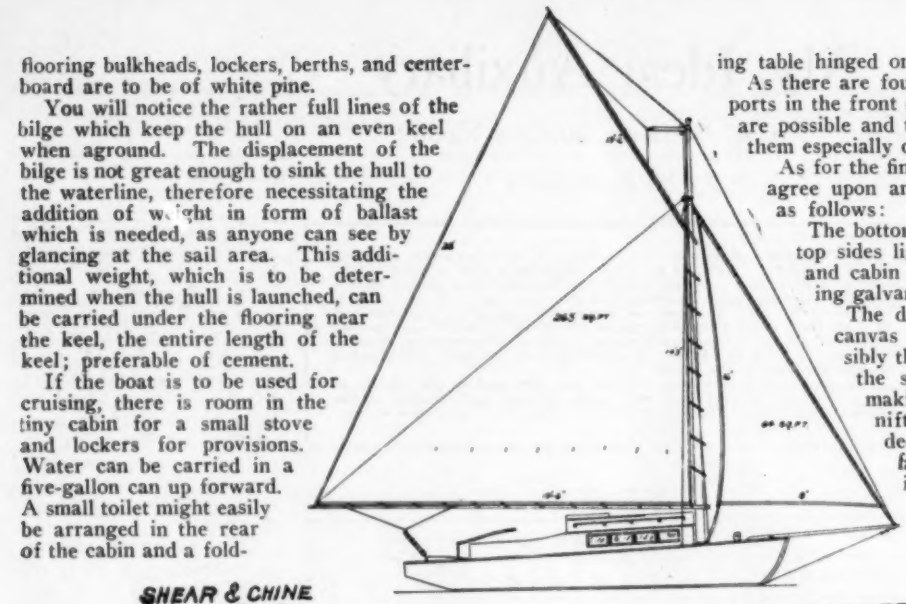
If the boat is to be used for cruising, there is room in the tiny cabin for a small stove and lockers for provisions. Water can be carried in a five-gallon can up forward. A small toilet might easily be arranged in the rear of the cabin and a folding table hinged on the center board if desired.

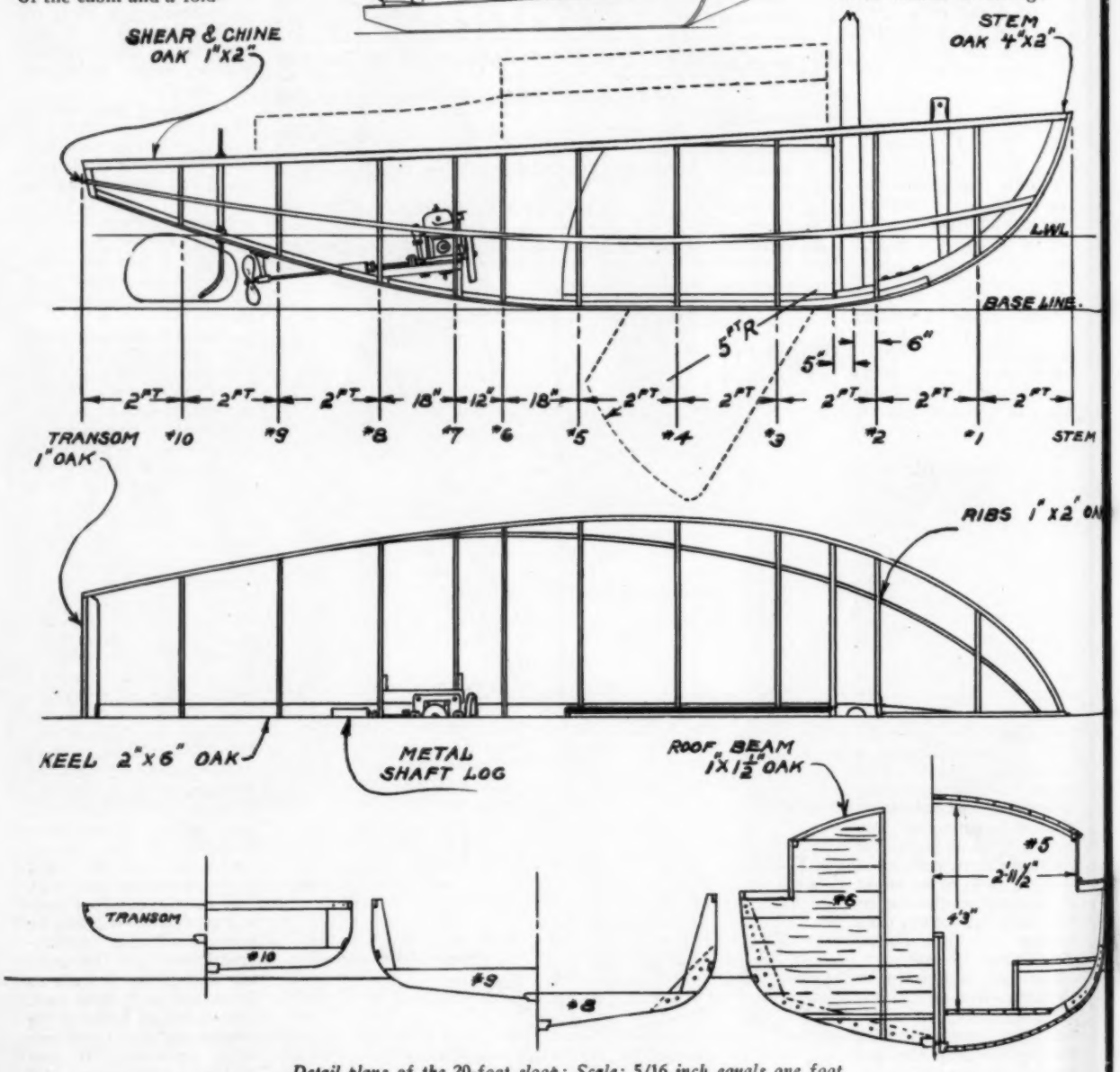
As there are four windows on a side and two ports in the front of the cabin, real light and air are possible and the cabin being so small make them especially desirable.

As for the finish of the sloop, no two would agree upon anything but my intentions are as follows:

The bottom to be dark green copper, the top sides light gray enamel, the coaming and cabin sides varnished, hardware being galvanied.

The deck and cabin roof are to be canvas covered, buff-colored, or possibly the deck could be varnished and the seams filled with black putty, making a striking contrast and a nifty deck. However, the canvas deck would prove the most satisfactory and least difficult to keep in condition. The interior of the cabin can either be all varnished or painted white with walnut trimmings.



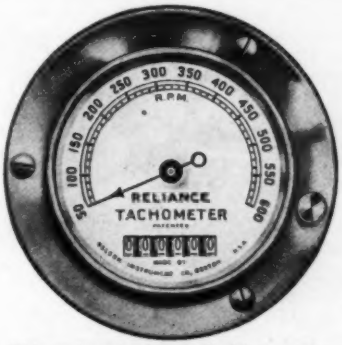


Detail plans of the 20-foot sloop; Scale: 5/16 inch equals one foot

New Things for Motor Boatmen

Each month new parts, attachments, and fittings, interesting and invaluable to owners of large and small motor boats, are added to the devices already on the market. Announcements of these articles come to us in such numbers that in order to introduce all of them to our readers we have been obliged to omit descriptions and publish only illustrations with short explanatory captions. In doing this, however, we urgently invite our readers to write us for complete information, as we shall take the greatest pleasure in providing it, together with the name and address of the manufacturers from whom the products may be obtained.

A renewable fuse that offers several distinguishing features. The gray, hard fibre shell is of unusual thickness: brass end caps and washers are particularly heavy. An ingenious ventilating patch is provided for the escape of gases generated during the operation

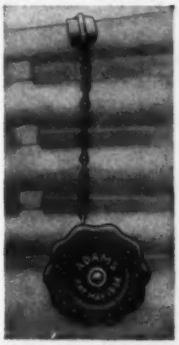


This tachometer has a checking counter by means of which, at any time, the accuracy of the pointer may be verified. It does not run continuously; it is operated by a button at each side of the case. It is invaluable when navigating in a fog

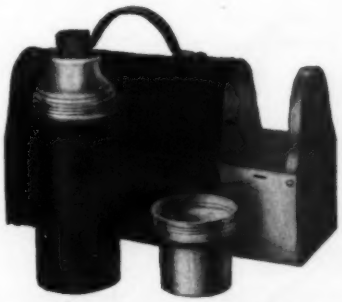
The noteworthy feature of this compressed air starter is that it replenishes its energy in less time than any other starting system in existence, its manufacturers say. It recharges itself in thirty seconds. No alteration in motor or other gear reductions is needed for attachments

Convenient to use, with outside wind and set, this clock may also be regulated from the front. It has an eight-day movement

Heat generated by an electric current has solved the problem of keeping motor boatmen warm in open boats in the coldest weather. This suit has a rubberized moleskin coat lined with lamb, an electrically heated helmet-lining of silk jersey and similar linings for moccasins and gloves. The suit is not heated as it is only necessary to protect the extremities



A motor boat top holder that is both neat and efficient. The chain is of steel, sherardized and enameled. Its strength is three times more than that of a strap holder



A boating luncheon with a steaming hot cup of coffee, or an ice cold glass of milk can be enjoyed with this lunch box. It is of heavy tin, of firm and durable construction and built to stand long and severe usage

To know positively at all times that the engine of your motor boat is functioning properly, is performing smoothly and accurately. Constructed on the centrifugal plan of physics this tachometer is absolutely accurate

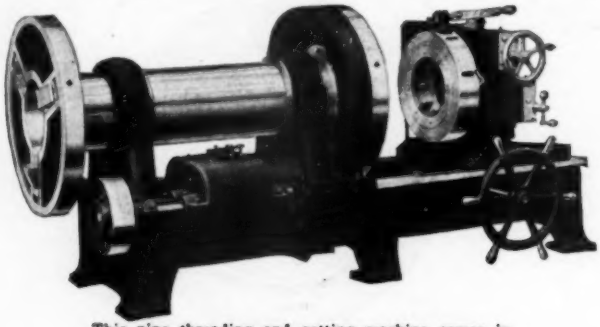
For small ship's galleys this stove is ideal. A hot blast tube passes through the smoke flue thereby heating the draft air before it strikes the fire, producing perfect combustion. The firebox is made wide and deep for wood

Do not fail to write to the editor if you desire information concerning any of the above new things

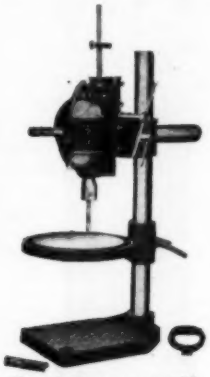
Efficiency Devices

From time to time manufacturers put on the market improved devices which are designed to increase the efficiency of individuals and plants in doing certain work. Among these are generally a number valuable to boat owners and boat builders, in repair and construction work. In order that those who desire to use them may know just what they are like illustrations are published, while a short description is given in order to explain just what they are for.

The advantage of this hammer handle screw-driver is that it answers every purpose of an ordinary screw-driver, plus the uses of a hammer. When not used as a hammer the upper part of the blade snaps into the handle, making it vertical like other screw-drivers



This pipe threading and cutting machine comes in several sizes, each size covering a range of eight or ten sizes of pipe. Dies can be furnished for threading pipe, casing or bolts

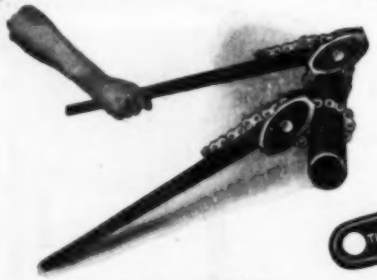


Used both as a portable hand drill and a bench drill this is a handy tool. Height over all 37 inches. Weight 150 pounds. It can be taken out of the frame for use as a portable hand drill

This reversible ratchet wrench will offset trained skill. The opening clear through the head makes it possible to run a nut down on a long bolt. Wrench heads are interchangeable in each handle to fit nuts

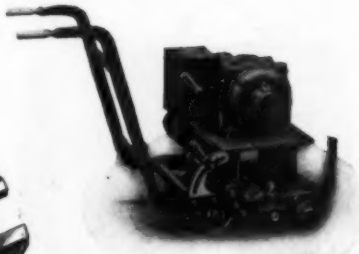
For removing rust and paint from the hulls of boats; for scaling boilers, grinding, buffing, polishing, drilling, reaming, etc., this rotary scraper machine does the work of ten to fifteen men working with chipping hammers, or about twice the work of a compressed air chisel or hammer. Can be connected to nearest lamp socket. They have Westinghouse motors

A labor saving bit, unlike other bits, is guided by its circular rim instead of its center. Consequently it will bore any arc of a circle and can be guided regardless of grain or knots, leaving a true polished surface



Tight corners won't bother you with this chain pipe wrench. It is two wrenches in one. The first, wide and powerful for standard pipe work — the second, with outer jaws removed, for narrow or irregular work and it is reversible

An adjustable S wrench with a handle of malleable iron and a jaw of forged steel. It can be used in corners or in contracted spaces inaccessible to the monkey wrench



This portable electric deck planing machine is furnished complete with motor ready to operate. The depth of cut is adjustable and knives lift clear of deck on return movement

Do not fail to write to the editor if you desire information concerning any of the above efficiency devices

How the Diesel Engine Proves In

(Continued from April Issue)

PART V

By Herbert Haas

IN some pumps the push-rod has a constant stroke, but the starting point of its travel is influenced by the governor, and it subjects the lift of the suction valve to the same variation in travel. Pumps of this type are usually provided with a hand crank, which permits the lifting of the suction valve to its extreme position and the lifting of the discharge valve sufficiently off its seat to let the oil flow by gravity into the pump chamber and the fuel-valve oil-delivery pipe from the oil-storage tank (which is higher than the engine) by opening a cock connecting the pump chamber with the atmosphere. When the suction valve is held wide open the engine is stopped. These pumps have been developed to a high degree of perfection, and notwithstanding the severe conditions under which they have to operate they are highly reliable.

Pumps may be vertical or horizontal; the former are used if operated from the camshaft; although pumps with a variable stroke of the plunger are usually of the horizontal type. Pumps driven from the vertical governor shaft of the vertical engines are usually horizontal.

Number of Pumps Required

Practice regarding the number of fuel pumps supplied with multi-cylinder engines differs, being often decided by a desire to reduce manufacturing costs.

When only one pump is supplied the fuel has to be divided and proportioned equally to the different cylinders. This is done with small steel diaphragms, the size of the holes being determined experimentally, allowance having to be made for the resistance in the different pipe branches leading to each fuel valve. This method is not entirely satisfactory, especially where a high degree of regulation is desired, as in synchronizing. With a decrease in load, some of the cylinders will receive an excess of fuel, the supply being proportioned to the load before the governor acted. If one or more of the branches is obstructed the active cylinder will be overloaded, and if any of the fuel valves or the fuel passages to them leak the active cylinders will be underloaded.

In pumps that are driven by the vertical governor shaft, which in an engine having a four-stroke cycle makes double the number of revolutions of the camshaft, the plunger delivers the fuel in two parts for any one fuel charge, corresponding to one revolution of the camshaft. The governor, by acting between the two plunger strokes, can therefore adjust the second part of the fuel charge to the new engine load, counteracting somewhat the defect mentioned. As a result of the desire to improve the regulation further, individual pumps are often built as multi-plunger pumps, one plunger being provided for each fuel valve (each cylinder). As the plungers are driven simultaneously by one eccentric device they divide the fuel effectively, but the governor continues to influence only the combined quantity of fuel delivered by all the plungers and not of that delivered by each plunger successively.

To avoid these defects many builders provide an independent pump for each cylinder, each pump being separately under the influence of the governor. The cams or eccentrics actuating these pumps are mounted on the camshaft (or the governor shaft) with different leading angles, corresponding to the sequence at which the different fuel valves act, and each pump delivers the oil just before the fuel valve it serves opens. Engines so equipped have the most effective regulation.

Air Compressors and Receivers

The air required for starting the engine and for atomizing and injecting the fuel is furnished by an air compressor. On account of the high pressure necessary, the air is compressed in two or three stages. Ample cooling of the compressor cylinders and of the air in intercoolers between stages is not merely desirable to approach isothermal compression and reduce the power needed for compression, but is necessary to avoid accidents that may wreck the compressor, with possible injury to the operators. With insufficient cooling of air and excessive use of cylinder-lubricating oil or of an unstable oil, the oil vapor may form an explosive mixture with the heated air and be ignited upon compression. Three-stage compression is therefore much to be preferred, as it permits compressing the air more gradually, and the lower compression ratios avoid excessive terminal temperatures; it also permits cooling the air more thoroughly in intercoolers before it is passed from one stage to the succeeding stage.

The air leaving the last stage of the compressor should be passed through an aftercooler and an oil separator before it is stored in the air receivers. This step is taken not so much to prevent a drop in pressure in the injection air bottle, with the contraction of the heated air on cooling, as to avoid explosions of the heated air charged with oil vapor. Regretable accidents have happened from failure to provide intercoolers and aftercoolers. Not only pipes, but air receivers as well, have burst. Flame passing through the air pipe and into the air receiver charged with oil vapor has ignited this vapor and blown up the receiver. The aftercooler cools the air, and the oil-and-water vapors are condensed in the separator and from time to time are drained.

The air compressor should be lubricated thoroughly, but without the use of an excessive quantity of oil. The oil used should have a paraffin base, should be of great stability at high temperature, and should have high flash and burning points.

The air compressor is usually driven direct from the main shaft of the engine. On multi-cylinder engines with closed crankcase the compressor usually has the appearance of an additional cylinder, the compressor cylinders and pipe-coil air coolers being surrounded with a mantle forming a water space.

On some engines, especially large units, more than one compressor is used to avoid the large size necessary with only a single compressor. Moreover, greater accessibility and reliability are obtained, and the work of compression is divided into a larger number of smaller absolute impulses.

Compressors may be vertical, horizontal, or inclined for both vertical and horizontal engines. They are made of cast iron, with water-jacketed cylinders, or are surrounded by a mantle which forms a large water space and in which are housed the air-cooling coils. More systematic cooling can be done by using water-jacketed cylinders and independent intercoolers. Also, these then become more accessible. The cylinders are stepped down to correspond with the number of stages; likewise the pistons, which are of cast iron. The high-pressure end is usually too small in diameter to permit extending the snap rings sufficiently to slip them over the piston. They are then held between spacing rings and locked with a nut in the end of the piston.

The valves are metal poppet or disc valves. The discharge and intake valves between stages are preferably housed together in one cage, of a construction that facilitates their removal and replacement. The high pressure demands small clearance spaces; the interior of the cylinder-head end should therefore be free of pockets or dead spaces, and the valve-seats should conform closely to the inner surface of the cylinder; the piston likewise should conform to the shape of the cylinder head to permit its close approach to the head. Each intercooler should be fitted with an oil separator, so that excess lubricating oil and condensed water can be separated and drained and not allowed to pass on to the next stage.

A blow-off (safety) valve should be placed in the high-pressure air pipe leading to the air receiver, directly back of the high-pressure end of the compressor (past its discharge valve), to prevent the bursting of the pipe as the result of an obstruction. The necessity of an aftercooler and an oil separator has already been mentioned.

Compressor troubles are probably responsible for a large proportion of shutdowns in the operation of the Diesel engine. Particular care should be used in compressor construction to make all parts as simple as possible and still retain the maximum efficiency and reliability. Valves should be readily interchangeable, and the material and workmanship of the highest order.

The air for the compressor is usually stored in three air receivers, two large ones for the air used in starting the engine and a smaller one for the injection of air. These receivers are made of seamless drawn steel, and to avoid heavy walls and excessive weight are relatively long and of small diameter (L/D = 4 to 8). They are interconnected with a system of pipes controlled by valves, so that either of the large bottles can be replenished with air from the injection-air bottle, which is supplied from the air compressor. The valve bodies are machined out of solid forged-steel blocks. The valve bodies are connected to the air pipes by copper cones and steel gland nuts. The valves are controlled by large 8-inch hand wheels.

One of the large air bottles is used for storing a reserve supply of air under a pressure of 1,000 pounds per square inch. Air is drawn from the other when the engine is started. The latter bottle is refilled as soon as the engine is in operation. The air compressor is designed amply to replenish in fifteen to twenty minutes' running the air so used without drawing on that used for injecting the fuel with the engine at full load: Manometers are provided to indicate the pressure in the large bottles and the injection-air bottle and the intermediate pressure of the compressor. At least one of the large air receivers is filled with air at the manufacturer's works and shipped with the engine to be used in starting it for the first time. Before the engine is started at any time the operator should convince himself that every part of it is in operating condition; should he fail to start it by turning on the starting air he should close the air valve at once and locate the cause of failure rather than make a number of attempts and waste the compressed air.

If all the air has been used before the operator has succeeded in starting the engine which operates the compressor for producing a fresh supply, compressed carbon dioxide (carbonic-acid gas) can be used in lieu of compressed air. To prevent the freezing of the gas when it is drawn, the top part of the container may be warmed by wrapping cloths soaked in hot water around it. The container should not be heated by such means as torches, as there is great danger of bursting it from overheating the gas.

The size and the number of air receivers vary with the size of the installation. In power plants using a number of engines it is well to interconnect the air receivers of the different engines, so that any one can be drawn upon in emergencies for any of the engines. Small engines need a relatively greater air-storage capacity per horsepower than do large engines. The capacity required varies from fifteen to twenty gallons per 100 h.p. for the injection-air bottle and from 60 to 200 gallons per 100 h.p. for the starting-air receivers.

Regulation of Air Supply

The air supply to the fuel valves is regulated by throttling the discharge valve on the injection-air bottle, and the desired pressure, indicated by a manometer on the injection-air bottle, is maintained by correspondingly throttling the air going to the air compressor at the air intake.

Each bottle is provided with a cock and a drain-pipe reaching to the bottom of the bottle to drain it of accumulated condensed water and oil.

For starting some engines, low-pressure air is used (100 to 250 pounds per square inch), which is stored in the standard type of sheet-steel, riveted air receivers. The receivers are filled with air drawn from the injection-air bottle and supplied by the air compressor. In other engines the air receivers are eliminated altogether and a seamless steel pipe is used between the compressor and the fuel valves, the pipe taking the place of the injection-air bottle. A separate small compressor, driven by a gasoline engine, supplies the starting air. This practice lowers the first cost of the engine, but the absence of any air reserve makes it necessary that the compressor furnishing the injection air be of unfailing reliability. With the opening and closing of the fuel valves and the lack of sufficient receiver capacity the pressure fluctuates, and with an obstruction in the pipe the pressure may rise abruptly and burst the pipe, as even the precautionary blow-off valves cannot be depended upon to act unfailingly. The presence of a gasoline engine with its highly inflammable fuel introduces a fire risk that is absent in installations that derive the starting air from the engine-driven compressor and have in the engine-room only a small supply of fuel oil with a high flash point. This advantage of the Diesel engine should not be appraised too lightly in many industrial plants, such as textile and flour mills.

As the volume of air drawn into the engine is considerable—about 635 cubic feet per minute for a 100 h.p. engine having a four-stroke cycle and about 850 cubic feet per minute for an engine having a two-stroke cycle—especially in large installations, means of admitting an excess of air to the engine-room must be provided. However, the noise will probably be considerable and the windows will vibrate and and shake under the continuous waves produced by the periodic air displacements. It is therefore a better plan in large installations to draw the air from the outside through large conduits built in the foundation and connecting with the different air intakes to the valves.

Two-stroke engines are provided with air through the air (scavenging) pump, so it is necessary merely to have the pump intake connected with the air canal.

Wherever the air is likely to be contaminated with dust, it should be filtered to prevent excessive cylinder wear and the shortening of the life of the engine.

Exhaust Pipes

The exhaust pipes should be of cast iron, as steel pipes corrode rapidly, especially when the fuel oil contains an appreciable quantity of sulphur. The sulphur burns to sulphur dioxide, which may be oxidized to the trioxide in the engine cylinder, and combine with the water vapor of combustion to form sulphurous or sulphuric acid. The exhaust gases should never be cooled to the condensing point of water, which would cause corrosion. As the exhaust gases issuing from the engine are hot (600 deg. to 1,000 deg. Fahr.), the exhaust pipes are jacketed and water-cooled in the proximity of the engine to make work around the engine bearable to the attendants and to prevent burns.

It is customary to provide a test cock in the exhaust pipe near the cylinder head. By holding a piece of white paper over this cock determination can easily be made as to whether combustion is perfect or incomplete. The exhaust should be colorless.

Storage of Fuel Oil

As Diesel plants use about one-third the quantity of fuel oil consumed by efficient steam plants, the storage capacity can be proportionately reduced. In the engine-room are one or more small fuel-supply tanks, usually of a capacity to run the engine for half a day. In small installations, a hand-operated fuel pump is used to refill the small fuel tank with fuel oil from the main fuel-oil storage tanks. In larger installations a motor-driven pump is used. Whenever the viscosity of the oil is such that it will not flow readily through the pipes at ordinary temperatures, means to heat the oil to increase its fluidity sufficiently have to be provided. The usual method is to pass the hot jacket water through pipe coils in the small fuel tanks, or to have these tanks provided with water-jackets, through which the hot water from the engine jacket is passed. Provision then has to be made for another smaller fuel tank, in which gas oil (ignition oil) for starting the engine is stored; this is switched on when the engine is to be stopped for any length of time. The fuel supplied to the pipe leading to the engine fuel pumps is controlled from either supply tank by a three-way cock.

When the fuel oil contains sand or other foreign matter, small filter tanks are provided; the fuel oil from the small fuel-supply tank flows through these filter tanks into the main fuel-supply pipe to the engine fuel pump through two branches (one from each filter tank) controlled by a three-way cock. This arrangement permits switching one tank off the circuit for cleaning while the other continues to supply the engine with fuel. As an additional safeguard, filter plugs are placed ahead of the intake valves of the fuel pumps.

The fuel tanks are supported on brackets or a platform on the wall opposite the engine and high enough above it for the fuel to flow by gravity to the engine fuel pumps. Usually each engine is supplied from its own small fuel-supply tank.

A 32-Foot Stock Cruiser to Be Marketed at a Reasonable Price

By William Atkin

THE plans of the 32-foot cruiser herewith illustrate the appearance and general cabin arrangements of a craft that will be manufactured on a quantity basis by Robert B. Patrick, of Jamaica, L. I. Mr. Patrick has made a study of the problem of creating and supplying a popular boat at a popular price, and just as soon as a suitable and an accessible site can be secured will erect a boat building factory—not a shop—wherein, so to speak, materials will enter at one end and completed boats of one size and kind immerge from the other.

The boat determined upon is of the following dimensions: L.O.A. 32 feet, L.W.L. 31 feet 5 inches, width 9 feet 3 inches, draft 3 feet 6 inches, and of the round bilge type.

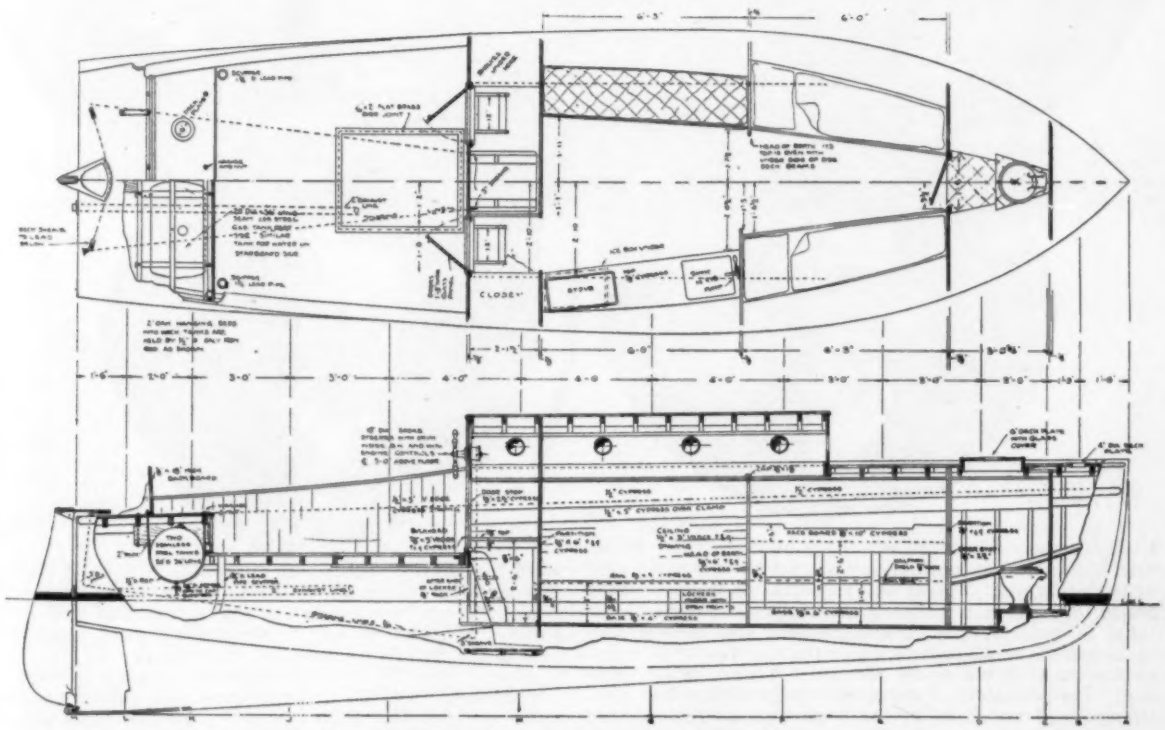
The materials entering into the boat's construction will be of selected woods and as follows: Keel white oak 3¾ inches thick by 8 inches, and in a single length; the frames will be of steam bent 1¼ x 1½-inch white oak; the stem of hackmatack; the stem of oak, and all clamps and stringers of single length yellow pine.

It may not be amiss to mention that the keel stem and stern will be set up in a specially designed, and patented, mold that also serves as a metal model within which the frames are also bent and set to the exactness of one-sixteenth of an inch.

The planking will be of ⅞-inch cedar laid in narrow widths, but long lengths, and edge nailed just as the planking is laid on the famous Hampton boats.

All floor framing, deck beams, cockpit floor beams and cabin carlins will be of yellow pine, and the frame work inside and out of cypress trimmed with oak. The boat will be painted with four coats of yacht white above the waterline and with one coat of red lead and two coats of Kirby's or Bridgeport bronze below the waterline. The decks will be canvas covered and painted, while the joiner work will be varnished.

Here is a definite promise of a real boat. Letters addressed to Mr. Patrick, Jamaica, L. I., will bring full particulars to MoToR BoatinG's readers.



Plans of the 32-foot stock cruiser designed by Mr. Atkin

To Manufacture Marine Motors By Up-to-Date Production Methods

The Long Established Murray and Tregurtha Company of Boston Reorganized and Moved Into a New Factory at Atlantic, Mass.

ABOUT thirty-three years ago, John A. Murray and George Tregurtha formed a partnership, known as the Murray & Tregurtha Company, opened up a small machine shop in Boston and entered the designing and building of steam engines for yachts and small work boats. Three years after they opened business, George Tregurtha designed his first internal combustion gas engine and after many days of arduous work the Murray & Tregurtha company finished their exhaustive tests on a heavy-duty marine engine which is known the world over for its reliability and efficiency.

The Murray & Tregurtha company have gradually grown until they became one of the leading boat and engine builders in the United States. Their products have been well and favorably known throughout the entire country and it is only natural that the Murray & Tregurtha company would branch out into a large productive organization.

On February 1, 1919, a new company was incorporated to take over the Murray & Tregurtha Company. This organization is known as the Murray & Tregurtha Corporation. The personnel of the former organization has been strengthened materially by the acquisition of some of the leading talent in the marine engine field.

The Murray & Tregurtha Corporation are just completing their new factory at Atlantic, Mass., which when completed will be the largest factory in the United States devoted exclusively to the manufacturing of marine internal combustion engines.

The new factory will be equipped with all up-to-the-minute machinery and such production equipment as is necessary to manufacture their engines on a large scale.

The new company has eliminated the yacht and boat building departments of the business and all their efforts will be devoted to the manufacture of engines.

M. Douglas Flattery, one of the best known business men and financiers in New England, has been elected chairman of the board of the new Murray & Tregurtha Corporation. Mr. Flattery has the reputation of being a very successful man and is at this time interested in many such successful enterprises as the Old Colony Woolen Mills Company, the Loew's Theatres Company, and is also director in a number of banks, trust and steel companies. Mr. Flattery will be the guiding hand which will control the policies of this new corporation.

John A. Murray is the president of the new Murray & Tregurtha Corporation and was one of the pioneers of this business. Mr. Murray is internationally known as one of

(Continued on page 72)

M. Douglas Flattery, Chairman of Board

John A. Murray, President of the new Murray & Tregurtha Corporation

Otis C. Funderburk, 1st vice president and chief engineer

Linus C. Coggan, Secretary & Treasurer

Frank B. Sexton, 2nd vice president, director of Sales, Service and Advertising

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

Propellers in a Nutshell

Giving for the first time full details concerning the Columbian motorship and heavy work boat wheels, the Columbian Bronze Corp., of New York, has issued a new catalog, calling it *Propellers in a Nutshell*. This company has lately received an order for 366,000 pounds of bronze propellers from the Emergency Fleet Corporation, a contract of approximately $100,000, it being the intention of this Government shipbuilding agency to construct their new vessels with bronze propellers and to replace some of the iron and steel ones now in service on other vessels with bronze ones.

The catalog is of forty-eight pages, and contains a mass of information of real interest to every owner and prospective owner of a motor boat. At the back of the catalog are valuable tables covering the speed of boats in miles per hour in relation to the diameter and pitch of the propeller used. Also a time and speed table whereby it is easy to figure the speed of a boat after either the statute or nautical mile. Copies will be sent to those interested who mention MoToR BoatinG.

Blackburn Now Manager of Gray Motor Co.

Continuing its policy to furnish its customers with the very best mechanical ability it is possible to secure, the Gray Motor Co., of Detroit, Mich., has secured W. R. Blackburn, who for twelve years has been connected with the Cadillac Motor Car Company, and lately as factory manager and builder of the Cadillac Liberty Motor and the famous Cadillac-8.

Mr. Blackburn enjoys the distinction of being one of the greatest intense production experts, manufacturing the highest grade motors in the world. He received his early training as a mechanic in the factory of Browne & Sharpe, of Hartford, Conn., and later was connected with the Burroughs Adding Machine Company.

The new Gray four-cylinder, 3½x5 gasoline or kerosene marine motor, will be manufactured entirely under the supervision of Mr. Blackburn. The Gray Motor Company feels that its customers are very fortunate in having the services of a man of Mr. Blackburn's long experience and success. The development of motor building has taken tremendous strides in the last few years. The fact that it is possible to produce an eight-cylinder motor like the Cadillac, in spite of the contention that the multiple-cylinders would increase the possibilities for trouble, has proven that there is no limit to what can be done in manufacturing when the right men undertake the job.

The production of the Cadillac-8 was one of the most wonderful feats in the history of the engine business, not because it was such a good motor, but because it was produced in such great volume, at a comparatively low price, and has given such universal satisfaction and was the first eight-cylinder motor to come out in this country.

A New Sedan Type for Commuters

A new type of sedan to be used in commuting between summer homes and nearby cities has been developed by the Great Lakes Boat Bldg. Corp., of Milwaukee, Wis., and one is now being constructed at Milwaukee for C. C. Pape, of St. Louis and New York. This craft is designed to make 40 m.p.h., and for that purpose is powered with a pair of eight-cylinder Van Blerck engines. In order to afford comfort for the owner, the main cockpit is placed forward of the engines, where it will be free from noise. This cockpit is completely enclosed with a special automobile top made by the W. S. Seaman Company and will comfortably take care of ten persons. The engineer will operate his engines from an after cockpit. Should the owner desire the pleasure of driving his boat at high speed, he need but reach out for his controls, which are brought to the forward cockpit for that purpose. The power plant is housed in under a trunk cabin, which allows full headroom in the engine compartment. A toilet is provided under the main deck with a door opening into the forward cockpit.

The sales force of the International Magazine Company which is responsible for giving MoToR BoatinG practically twice the circulation of any other publication in the marine field. This force of salesmen at a recent conference held in New York City was given instructions to obtain a circulation of 30,000 for MoToR BoatinG before December 31 of this year. This means a still further increase in circulation of about 50 per cent. The names of those persons in the illustration are as follows: First row (left to right, from the top): C. H. Eiser, Jr., New York City; Russell Holt, New York City; J. H. Barr, Boston, Mass.; E. A. Flynn, New York City; C. M. Gunnison, Chicago, Ill.; Geo. E. Houston, Atlanta, Ga.; W. M. Eldridge, New York City; C. I. Togstad, New York City. Second row: W. G. Sullivan, Atlanta, Ga.; J. W. Kenney, Chicago, Ill.; Mat Sullivan, Boston, Mass.; E. W. Cox, New York City; G. Johnston, New York City; J. A. O'Connor, Los Angeles, Cal.; K. V. Krembs, Toronto, Can.; J. M. Eisenlord, Chicago, Ill.; D. M. Wall, New York City; B. H. Totzek, San Francisco, Cal.; C. H. Mason, New York City. Third row: Miss A. E. French, New York City; Miss R. Terrill, Chicago, Ill.; W. R. Brown, New York City; J. H. Schnackenberg, New York City; J. D. Dargon, New York City; P. H. Nystrom, New York City; T. D. Rodlum, New York City

Let There Be Light

Nothing adds more to the terror of those on a sinking ship than darkness. During the war when a vessel was torpedoed at night and the engine-room was flooded or the engineers were forced to abandon their posts and the craft was plunged into the black shroud of impenetrableness, many lives that might have been saved were lost because of the difficulties in launching boats without lights. Persons who might have been placed aboard these boats lost their way in the maze of passages and compartments below decks; injured were overlooked and could not be found; while the wireless set that should have been speedily summoning assistance was perforce silent.

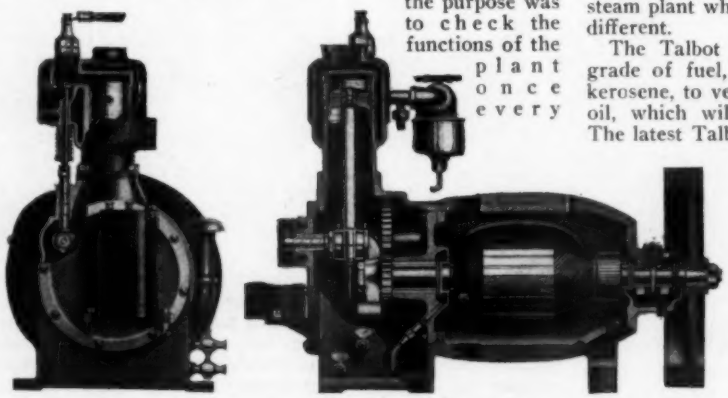
In order then that this danger and confusion might be eliminated on the transports conveying the American troops abroad, the Emergency Fleet Corporation began looking around for an auxiliary electric plant that would furnish the current in just such emergencies. It was decided that the plant would have to be compact enough to be stored as far from the possible danger point or the place where the water would flood the ship and the Government experts decided that the Matthews Engineering Co., of Sandusky, O., should devise and construct these plants.

This firm had already produced sets of a similar nature ideal for peace-time purposes, and the Government engineers believed that it could produce just what they wanted for war-time work. Additions to the Matthews plant were necessary, and one new building alone was constructed with 18,000 feet of floor space, while the whole enterprise expanded into four times its original size. This, however, did not delay work on the lighting plants, and while one section of the factory was going up other sections were turning out the plants. The plant was made compact enough to be placed on the upper deck of the ship, where it would be practically out of harm's way and furnish current as long as the ship was afloat.

The Shipping Board required absolutely automatic functioning plants; a plant which did not lose its head in the moment of greatest excitement, not for one-tenth of a second might its potential waver when the precious auxiliary wireless current is required.

The auxiliary plant consisted of a 6 k.w. General Electric generator direct connected to a Standard Matthews 3½x5, four-cylinder, overhead valve engine, operating at a speed of 900 r.p.m., automatically started and governed, and automatically stopped. There was a 56-cell, 110-volt, 128-ampere hour, Willard storage battery connected with the plant for starting. This was all controlled by the Matthews full automatic switchboard, which contained all the instruments of their domestic automatic board which they built for years and a number of special functions required for the application to a ship. Among other things was a time clock; this was locked and under the control of the chief officer of the ship. He could set the adjusting dial of the clock and the plant would start once every twenty-four hours at the time he set it and run for twenty minutes. This operation was entirely automatic, and the purpose was to check the functions of the plant once every twenty-four hours without the element of human intervention of any kind.

Hog Island—The big shipbuilding establishments installed the Matthews lighting plants as the ships were constructed



The new automatic lighting plant of the 32-volt type of the simplest possible kind of direct connection of a generator to an engine which has been developed by the Matthews Engineering Co., of Sandusky, O. The generator frame and engine crankcase are cast integral. The engine is a four-cycle, water-cooled type having a 2-inch bore, and 3-inch stroke. The plant is guaranteed to have 35 per cent. overload capacity. A 60-ampere hour willard glass cell storage battery is used

Champion Boosts Motor Shows

Carrying out a consistent poster campaign, advertising the automobile shows in practically every city in the United States where an event of this kind was held, the Champion Spark Plug Co., of Toledo, O., has done its best to give publicity to the exhibitions. In carrying out this plan the Champion people were guided by the old axiom that "nothing succeeds like success." In other words they figured that if the event proved a big success, everybody and everything connected with it would derive some benefit from it.

The poster used was of the 24-sheet variety, specially designed and printed in seven colors. This co-operative form of advertising has made a big hit, especially among the members of the various automobile associations who are instrumental in promoting the shows. It also appealed strongly to the Champion Spark Plug dealers, as it gave them an excellent opportunity to boom their sales of spark plugs by linking up their local advertising with this poster showing.

Steam Plant for Small Boats

Steam is the most flexible source of power. The steam engine, therefore, is truly the engine of a thousand variable speeds. Ordinary steam power plants are so bulky that their use has largely been discontinued where compactness is of importance. The Talbot Engineering Corporation have developed a steam plant which they state is entirely different.

The Talbot boiler is suited to any grade of fuel, from light oil, such as kerosene, to very heavy thick Mexican oil, which will hardly flow in pipes. The latest Talbot boilers are also fitted for using coal and other solid fuels. About the same quantity of these cheap grades of fuel are used in a Talbot steamer as is required in gasoline to operate an ordinary gas engine.

Tests on Talbot Steamers show a fuel consumption between one-half and three-quarters of a pound of crude oil per shaft horse power. The Talbot engine is up to date in

machine design, closed-in running parts, all bearings are adjustable and are locked with castle nuts. All the wearing parts are easily removed and are interchangeable.

The Talbot power plant is interesting not only for its compactness, but even in the small sizes, the thermal efficiency is higher than that of the largest electric power stations. These power plants also operate at a greater thermal efficiency than the machinery in the largest steam ships. This is due to the high pressure superheated steam which is used.

The element of safety is also very important in using steam power plants. It is impossible to do damage by explosion of a Talbot boiler, as there are no large steam spaces, such as steam domes, boiler shells, in the ordinary sense. The reserve capacity of the Talbot boiler compares favorably with the express type boilers used in Navy destroyers, yet the element of danger is eliminated due to the lack of large pressure containers. The Talbot power plant, its manufacturers claim, operates on about 10 to 20 percent of the cost of an ordinary gas engine.

Navy to Sell Motor Boats

The Navy Department advises that ten more of the motor boats which were taken over for war purposes will be offered for sale May 1. These are all well known boats powered with engines of standard make. They are:

Name	Length	Power
Sea Hawk	62	360-400 h.p. motors
Grey Fox	48	Two 280 h.p. motors
Pope Mary	51	One 60 h.p. motor
Traveler	50	One 25-35 h.p. motor
Zig Zaz	44	One 140 h.p. motor
Kanised	90	One 150 h.p. motor
Grey Hound	39	Two 150 h.p. motors
Howarda	69	Two 32-37 h.p. motors

Sealed proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock noon, May 1, when they will be publicly opened. Full information and specifications of the boats may be obtained by addressing the bureau.

Gitana Sold to Walter L. Todd

The standardized 50-foot military type express cruiser Gitana, designed and built by the Great Lakes Boat Bldg. Corp., of Milwaukee, Wis., about a year ago, has been sold to Walter L. Todd, of the Todd Protectograph Co., of Rochester, N. Y., so that this year Rochester will be represented by a new express cruiser of the latest type. Mr. Todd has had an eight-cylinder Model F 200 h.p. 5½x6¾ Sterling engine installed.

Plans For Amateur Builders

A booklet has been issued by the John L. Hacker Boat Co., of Detroit, Mich., describing its plans drawn especially for the amateur mechanic. These plans are divided into three classes and are intended to cover every want. The first is the Sea Wolf type and is for boats ranging from 18 to 30 feet; the second is the Special Speed Type of 16, 21 and 26-foot designs; and the third is the Hoosier type.

These plans are all for 1919 and are the latest works of John L. Hacker who has specialized in V-bottom speed runabouts. The plans of the boats in the second class are improvements on Mr. Hacker's famous design that won the Mississippi Valley Association races, while those of the third class are for boats of over 30 m.p.h. These are based on Hoosier IV, designed by Mr. Hacker, which won the Southern Displacement Championship events at Miami in February, and is the holder of the A. P. P. A. record as the fastest displacement boat afloat. The booklet may be obtained by writing the company and mentioning MoToR BoatinG.

Standard Lightship Towed by 26-Footer

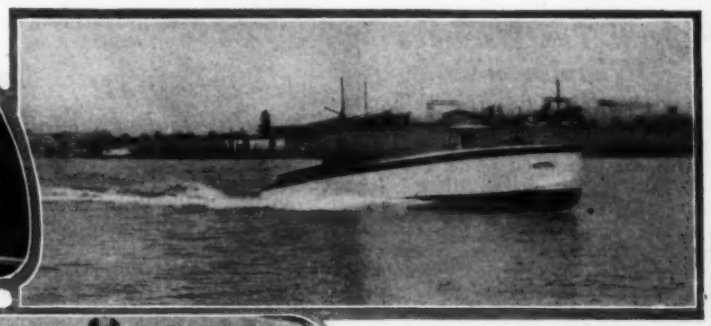
Towing a standard 100-foot lightship about the harbor of Buffalo; pulling a spar buoy 14 feet square by 30 feet long attached to a concrete sinker weighing 1,400 pounds out into Lake Erie, dragging bottom with the anchor on it, for three miles to mark the entrance to the channel for traffic down the Niagara River; and finally carrying a ton of cargo in her after cockpit without settling at the stern, are some of the remarkable performances of the pioneer of the little motor boats now being adopted by the Government as lighthouse tenders.

This pioneer craft was designed by Mr. Hotchins, of the Lighthouse Department, of Buffalo, N. Y., and measures 26 feet overall. She has a beam of 7 feet, 6 inches, a 4-foot draft of hold and displaces 7,500 pounds. It was designed on a block co-efficient of .763 and the co-efficient of the load waterline is .60. The power plant is the Model D 12-15 h.p., two-cylinder, four-cycle Sterling engine, which develops 11½ m.p.h., over a measured course. This boat has been running the entire season of 1918, operating as a tender to Lightship No. 98. There is not a straight line on her.

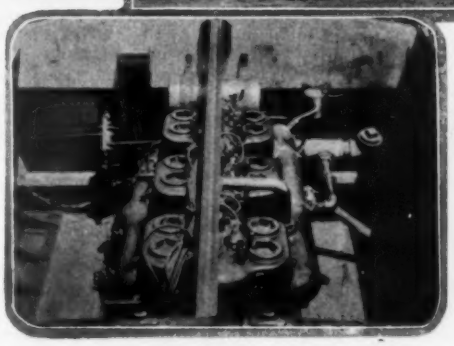
Hounding the Hun from the Seas

The Elco Works of the Electric Boat Co., of Bayonne, N. J., have issued such a handsome and elaborate brochure under the above title that it is hard to believe that it is intended for advertising purposes. In fact, one would never know that it was advertising if it was not for a little paragraph at the end of the brochure explaining

Herbert Fielder, the owner's chauffeur built the boat during his spare moments from a knock-down model shipped from the Richardson shop at North Tonawanda, together with frames, planking, and the entire hull construction



Nita is a 30-footer with a beam of 6 feet 4 inches, designed by Wm. H. Hand, Jr., for Mrs. Lutcher, of Orange, Tex. This was a most inexpensive boat and this plan of building at home is an excellent one for those who wish to save money



Powered with a six-cylinder, 5½-inch Sterling engine, Nita is a very speedy boat for her class, travelling well over 30 m.p.h.

the part the Elco people played in the hounding process.

The brochure is by an anonymous Lieutenant of the British Royal Naval Volunteer Reserve with notes from Lieutenant E. P. Dawson's book, *Pushing water*. The illustrations are from paintings in the London Graphic and photographs by Underwood & Underwood. The subject is written in the form of an adventurous narrative and generously interspersed with the illustrations. The printing, makeup and paper leave nothing to be desired.

Commodore Walker's New 40-Foot Runabout

Vice-Commodore H. J. Walker, of the Cleveland Yacht Club is having a runabout constructed by the Matthews Boat Co., of Port Clinton, O., which is said to be one of the most notable new designs of the season. It is a 40-footer, large enough to travel in open water at a speed comparable to the destroyers and absolutely has her ability to maintain her top speed on runs as far as from Cleveland to Detroit. The motor is a Model F eight-cylinder, 180-200 h.p. Sterling, which will turn 1,400 r.p.m., all day long under load.

Bruns, Kimball, & Co. Move

Following their previous announcements Bruns, Kimball & Co., have moved from their old location, 115 Liberty St., to 153-55-57-59 West 15 St., where they have quarters three or four times larger than the old ones. The ground floor, where the store is has a show window front of 85 feet on 15 St., and a depth of 110 feet. This, together with another room of the same size on the premises, makes a display room of over 18,000 square feet and is termed a continuous engine show.

Federal Tax Assumed by Champion Co.

Two days after the Federal Excise Bill which levies a five percent tax on all automobile accessories became effective, the Champion Spark Plug Co., of Toledo, O., wired its jobbers throughout the United States that the company would assume this tax and that it would not be added to the costumers' price on sales. Coming at a time when most jobbers and dealers were all at sea as to how the tax would affect them, it meant that every jobber could forget the Excise Tax as far as these spark plugs were concerned as the dealers' cost and selling price would not be disturbed. It also meant in the end that the public would not have to pay this extra five percent.

American Bosch Activities

The first sales convention held by the new Bosch company, the American Bosch Magneto Corporation, was held recently at the company's main plant, Springfield, Mass. The first morning was given to an automobile trip to show the visitors the interesting points of Springfield, while the afternoon was given over to the inspection of the works and the evening to departmental business at various clubs. The next two days were devoted to the discussion of trade matters, review of new products and a banquet was also held at the Naysset Club for the 100 executive and department heads. The executives of the new company who addressed the convention included: A. T. Murray, president; Geo. A. MacDonald, treasurer; A. H. D. Altree, vice-president; J. A. McMartin, secretary; A. H. Bartsch, general sales and advertising manager; G. H. Lang, assistant to the president, and F. D. Norman, factory manager.

The following were the executives and department heads who were among those attending:

Paul Furrer, branch manager of San Francisco; William B. Brown, branch manager; A. C. Wilson, assistant; E. J. Swanstrom, district supervisor of sales; G. Redemsky and F. J. Bartella, sales engineers, all of Chicago. T. C. Miller, branch manager; O. S. Stanley, assistant; L. B. Smith, district supervisor of service, and S. Hillman, sales engineer, all of New York. M. Tost, branch manager; A. C. Heyser, assistant; and Edward Frazer, sales engineer, all of Detroit.

Changes in the Bosch personnel include: W. G. Brown, transferred from New York to Chicago, as branch manager; T. C. Miller, former assistant branch manager at Detroit, has been made branch manager at New York; Harold A. Wilson, formerly of the Diamond State Fibre Co., was added to the Chicago office as assistant branch manager; A. C. Hyser, formerly in charge of service of the Willard Storage Battery Co., joined the Detroit office as assistant branch manager; Oliver S. Stanley, formerly assistant manager of the St. George Paper Co., Norwalk, Conn., joined the New York office as assistant manager.

Miss Detroit III Equipped with Hyde Propellers

When Miss Detroit III recently captured the Gold Challenge Cup at Detroit, it was the fifth consecutive year that this famous trophy had been won by boats equipped with Hyde wheels. In 1918 Miss Detroit III was also the winner of this trophy, while in 1917, Miss Detroit II carried it away. In 1916 Miss Minneapolis was the winner, and in 1915 it went to Miss Detroit, and finally in 1914, Baby Speed Demon II was awarded the trophy, all of which boats were Hyde-equipped, using the turbine type propellers.

The above information was furnished by W. C. Disbrow, Jr., of 71 Cortlandt St., New York, agent for the propeller, who added that Aeolus, winner of the Detroit News Trophy, and Hoosier IV, winner of the Open Displacement Races at Miami and Whip winner of the Miami Cruiser Championship, were also so equipped.

Great Lakes Designs Standardized 43-Foot Cruiser

With the construction for Kingman N. Robins, of Rochester, N. Y., of the first of its 43-foot standardized express cruisers, the Great Lakes Boat Building Corp., of Milwaukee, Wis., has begun to turn out this model, designed to follow standard lines. The Great Lakes shops, where the boats are evolved, contemplate the use of oak keel, sawn frames with steam bent oak ribs, fore and aft spruce battens, running fore and aft from stem to transom, clear white cedar planking.

A six-cylinder Model M, Van Blerck engine will give it a speed of 20 m.p.h.

There are to be two cabins, with the main one forward, where also is located a galley and toilet. The engine-room extends partly under the bridge deck and has a double laminated water-tight bulkhead forward and aft. The after cabin is just behind the engine-room. The bridge deck is designed to be comfortable and roomy, and is supplemented by the cockpit aft. The floor of the cockpit is above the waterline, but self-bailing scuppers are provided anyway. This space is large enough for four yacht chairs, although it is equipped with a deep lounging seat with tufted leather-cushion built across the after section. The cabins are finished in white enamel with mahogany trim and are the last word in moderate luxury. A second toilet is also provided aft.

Activities of the Buffalo Herd

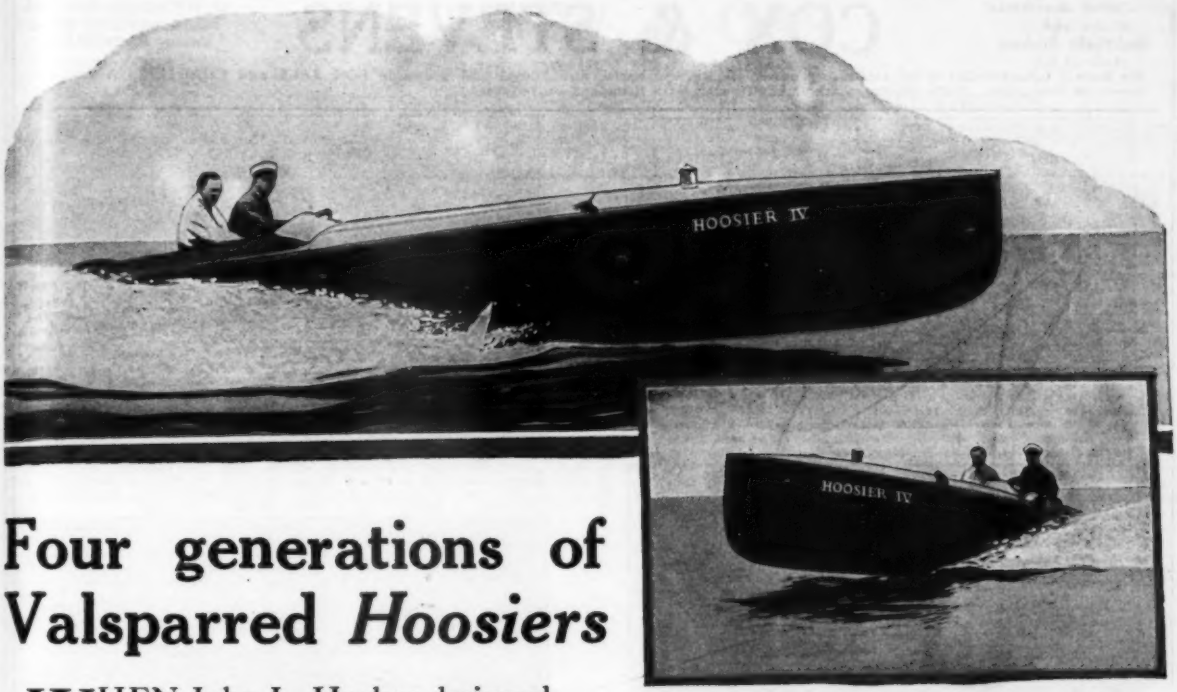
New distributing agents for Buffalo gasoline motors have been appointed in various places in the United States and Canada.

In the Philadelphia district Walter S. Carmen has been made exclusive distributor. Mr. Carmen has long been identified with the marine engine business. For a number of years he was a member of the firm of Carmen & Howes, general marine agents and engineers, and later was in Government service, being released January 1. His office and sales room will be located in the Bource building.

The Minneapolis territory will be handled by the Enterprise Machinery Company of that place. This company formerly manufactured the Westman engine, which they have discontinued.

The A. R. Williams Machinery Co. will look after the Toronto territory. This firm, located at 64-66 Front St., in that city, is one of the largest machinery houses in Canada, with branches throughout the Dominion and a large staff of engineers and service men at their call.

James C. Wilson, who for several years has sold Buffalo engines in the Toronto territory with considerable success, will continue his activities along that line. The new arrangement with the Williams people is not to conflict with Mr. Wilson, who will continue to handle the engines.



HOOSIER IV—Express runabout, seating five persons. Designed by John L. Hacker. Built by John L. Hacker Boat Co., Detroit. Owned by H. R. Duckwall, Indianapolis. Has a speed record of 40½ miles per hour and won two races at Miami.

Four generations of Valsparred *Hoosiers*

WHEN John L. Hacker designed the great-grandmother of the *Hoosier* family, he made her a thing of grace, beauty and speed—and he Valsparred her, of course.

Then came *Hoosier II* and *Hoosier III*. Mr. Hacker made some clever improvements in each of them; but he decided that he simply *couldn't* improve the varnish—so they were Valsparred, also.

Now we have with us *Hoosier IV* —youngest, speediest, flower of the flock. And is she Valsparred? She *is* —of course she is!

The *Hoosiers* certainly have the Valspar habit — like thousands of other water-craft, from the palatial yacht to the humble canoe and row-boat.

For Valspar is the ideal boat varnish —and experienced boat owners and builders know it.

Water-proof and weather-proof— "the varnish that won't turn white."

Sold by paint, hardware and marine supply stores everywhere.

Send for booklet "How to use Valspar on Boats." It's free.

VALENTINE'S
VALSPAR
The Varnish That Won't Turn White

VALENTINE & COMPANY
456 Fourth Avenue, New York
ESTABLISHED 1832—*Largest Manufacturers of High-grade Varnishes in the World*

New York, Chicago, Boston — TRADE VALENTINE'S VARNISHES MARK — Toronto, London, Amsterdam

W. P. FULLER & CO., Agents for Pacific Coast:
San Francisco, Los Angeles, Sacramento, Oakland, Stockton, San Diego, Pasadena, Long Beach, Santa Monica, Portland, Seattle, Tacoma, Spokane, Boise

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NAVAL ARCHITECTS
ENGINEERS
BROKERS
MARINE INSURANCE

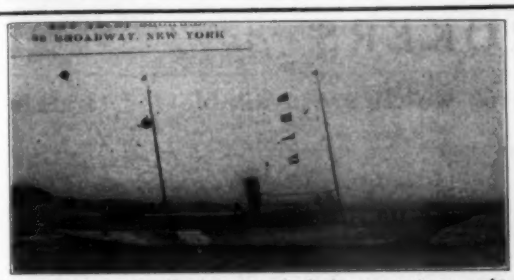
GIELOW & ORR

52 BROADWAY, NEW YORK

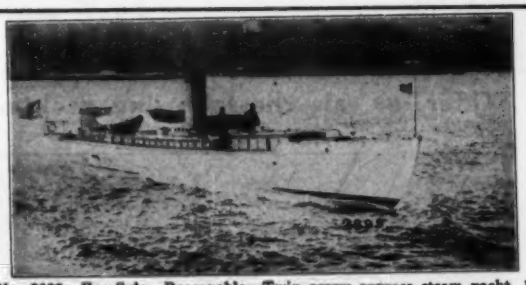
Telephone: 4673 Broad
Cable Address: Crogie, New York
A.B.C. Code

ALSO: CHICAGO STEAMBOAT EXCHANGE, 350 NORTH CLARK STREET, CHICAGO

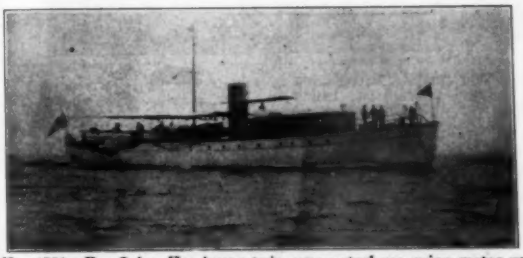
We have a most complete and up-to-date list of power yachts of all sizes, sail, auxiliary and houseboats on file in our office, kept constantly up-to-date by a thorough and comprehensive canvass of the entire yachting field from time to time. We are in a position to submit full information on any type of boat upon request. FOR SOUTHERN CRUISING this winter we offer a number of very desirable POWER HOUSE BOATS and POWER YACHTS which are specially adapted for FLORIDA waters.



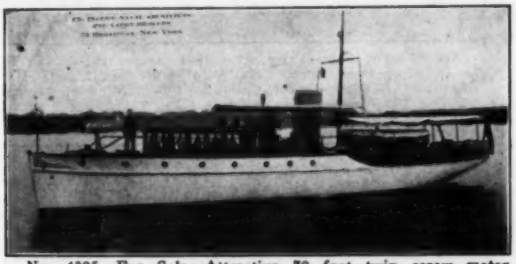
No. 232—For Sale—Handsome steel single screw steam yacht, 145 feet. 2 staterooms and deck dining saloon, also social hall on deck. Triple expansion engine and maximum speed 14 knots. Located New York. Gielow & Orr, 52 Broadway, New York City.



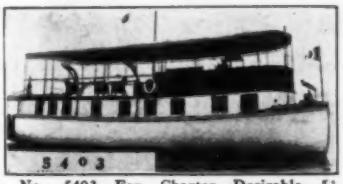
No. 2399—For Sale—Reasonable—Twin screw express steam yacht, 112 feet length, double stateroom and saloon. Built by Herreshoff. Owned as gentleman's yacht. Never been in patrol service, in perfect condition. Suitable for ferry or racing yacht tender. Gielow & Orr, 52 Broadway. New York City.



No. 4591—For Sale—Handsome twin screw steel sea going motor yacht, 126 feet length, 18½ feet beam, 6 feet draft. Built by Seabury. 5 staterooms, all modern equipment, perfect condition and located Great Lakes. Gielow & Orr, 52 Broadway, New York City.



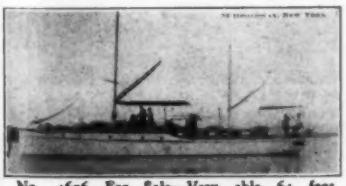
No. 4385—For Sale—Attractive 70 foot twin screw motor yacht. Two double and one single stateroom, owner's bathroom. Deck dining saloon. Heated by hot water, able sea boat, speed 13-14 miles. Gielow & Orr, 52 Broadway, New York City.



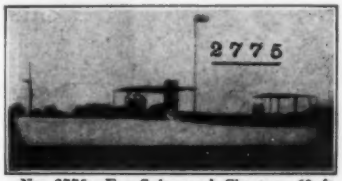
No. 5403—For Charter—Desirable 51 foot houseboat, Standard Motor. Large deck space. Two double and two single staterooms. Electric lights. Accommodations for seven persons. Gielow & Orr, 52 Broadway, New York City.

No. 5951—For Sale—40 ft. Hand express cruiser. New 1917. Van Blerck motor. Speed 20 miles. Best construction. Able sea boat. Fully equipped. Price reasonable. Gielow & Orr, 52 Broadway, New York City.

No. 3957—For Sale or Charter—Attractive 75 ft. cruiser, beam 13 ft., draft 3 ft. 6 in. Standard engine, speed 10 knots. One double two single staterooms. Accommodate five persons. Electric lights, hot water heat. Bargain. Gielow & Orr, 52 Broadway, New York City.



No. 4606—For Sale—Very able 64 foot cruiser, 12 ft. 6 in. beam, 4 ft. draft, 6 cyl., Heavy Duty motor new last year. Speed 10 knots. One double one single stateroom opposite main saloon. Accommodate five persons. Boat heavily built, especially for offshore cruising. Price reasonable. Gielow & Orr, 52 Broadway, New York City.



No. 2775—For Sale—and Charter—60 ft. Cruising Power yacht. One double stateroom and bath room. Saloon containing pullman berth and transom. Speed 11½ miles. Gielow & Orr, 52 Broadway, New York City.

No. 5850—For Sale—Modern 50 foot Express Hand cruiser, speed 20 miles, built 1916. 8 cylinder Van Blerck motor. Sleeping accommodations 4 persons. Completely equipped, inspectable near New York. Gielow & Orr, 52 Broadway, New York City.

No. 5455—For Sale—Desirable 48 foot cruiser having 14 feet beam, 34 inches draft, built 1915. Accommodations gives stateroom and saloon fully equipped. Speed 10 miles. Inspectable near New York. Gielow & Orr, 52 Broadway, New York City.

No. 6264—For Sale—Handsome keel and centerboard auxiliary schooner, 52' x 15' x 5' 6". Lawley built—excellent condition, fully found. Inspectable near New York. Gielow & Orr, 52 Broadway, New York City.

No. 6228—For Sale—31 feet Hand express Cruiser. Built 1917 Van Blerck Motor. Speed 20 miles. Able sea boat. Price attractive. Gielow & Orr, 52 Broadway, New York City.

Advertising Index will be found on page 112

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THE MOTOR BOATING MARKET PLACE

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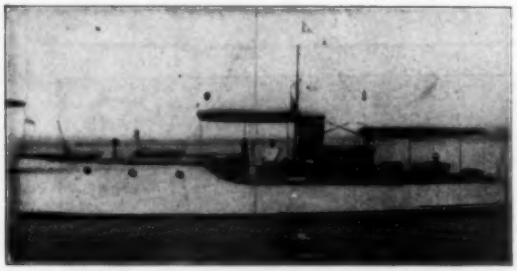
Cut one inch deep, one column wide..... $2
Cut 1½ inches deep, 1½ columns wide..... $5
Cut 2¼ inches deep, three columns wide.....$15

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offer of the month Please mention MoToR BoatinG.



FOR SALE—Hand V Bottom 50 x 10.3 x 3. New 1918 and fully equipped. Buffalo Engine 40-60. Bath. Matthews Lighting Plant. Price very low. S. G. Hodgson, 1401 Rockefeller Bldg., Cleveland, Ohio.

FOR SALE—An extremely seaworthy and reliable cruiser, 50 ft. x 14 ft. x 5 ft. Two cylinder 40 H.P. heavy duty engine. Speed 8 miles per hour. Was originally a heavy canvassed yawl. Captain's state room, large main cabin, sleeps 6 to 8. All white oak construction. Complete with binnacle, lights, galley, toilet, etc. J. Appleton, Port Washington, Wisc.

FOR SALE—Motor yacht, length 55, beam 11, draft 38 inches. Recently replanked. Ralaco 5 x 7, 4 cylinder, 4 cycle, heavy duty motor, just factory rebuilt. Boat thoroly overhauled at cost of $700. Speed 10-12 miles. Sleep seven. Fully furnished and equipped, ready to go anywhere. Sacrifice $2500. Worth $6500. Cash only. Dr. Schefcik, La Salle Bldg., Minneapolis, Minn.

Motor boat hulls, from 12 to 50 ft., all styles, with and without power, at reasonable prices. Good used engines, all types, cheap. We can offer you a good bargain in a complete motor boat or motor only. Tell us what you would like to have and we will quote our lowest price. Atlantic Supply Co., Long Branch, N. J.

NEW AND USED AIRPLANE MOTORS

Use an airplane motor in your boat

More Power and Speed

Less Gasoline and Weight

Airplane Motors, 30 to 300 H.P.
Lowest Prices

Send for Bulletin "MG"

U.S. AERO EXCHANGE 18 UNION SQUARE NEW YORK CITY

Trimount Whistle Blower Outfits
Blower runs by friction contact with engine flywheel. Whistle of brass, nickel-plated.
Made in 3 sizes.

Trimount Rotary Hand Bilge Pumps
All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.
Made in 3 sizes.

TRIMOUNT ROTARY POWER CO.
20 Heath Street Boston, Mass.
(Factory: 292 Whiting Ave., East Dedham, Mass.)

FOR SALE—35 foot, mahogany, Elco express, with practically new 8 cyl. Cadillac motor with electric starter, speed 23 miles per hour. Price $1500. This outfit is in good condition, and has an unusually complete equipment, including electric lights, auto top, leather cushions, 4 wicker chairs, life preservers, windshield, search light, canvas cover, fenders, flags, etc. R. E. Henry, 27 Pine St., New York City.

SALE OF U. S. NAVAL VESSELS (Yachts and Motor Boats).—Sealed proposals will be received at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock noon, 15th May, 1919, when they will be publicly opened, for the purchase of the yachts and Motor Boats YO HO, now in the First Naval District; COSSACK, now at Key West, Florida; EDITH M III, now in the Marine Basin, N. Y.; NIGHTINGALE, now at New London, Conn.; and SHIRIN, now at New Orleans, La. Exact location and permission to inspect may be had from the Commandant of the Naval District wherein located. Appraised values: YO HO, $2,000; COSSACK, $16,500; EDITH M III, $6,000; NIGHTINGALE, $4,000; SHIRIN, $12,000. The sale will be for cash to the bidder offering the highest price above the appraised value. Forms of proposal and bond, and information concerning the vessels, and the terms and conditions of sale, may be obtained upon application to the bureau of Supplies and Accounts. Josephus Daniels, Secretary of the Navy. 4-3-1919.

FOR SALE—A 29 ft. Runabout equipped with a Model 4B 20-35 Sterling motor with electric starter and lights, folding windshield, auto top with curtains, wicker chairs, life preservers, flags, etc. An excellent well-built sea boat with seating capacity for ten, boat and engine cost $3,000 and is as good as new in every way. Will sacrifice for $900 cash. J. H. Hagen, Riverhead, L. I., N. Y.

CANADIANS, Second-hand engine bargains. Send for list.
GUARANTEE MOTOR COMPANY
73 Bay Street, North Hamilton, Ont., Canada

WANTED—Second-hand brass steering gear and stand suitable for yacht 70 ft.
DAVIS & CHILD
1110 14th St., N. W., Washington, D. C.

USE "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

A few medium and high speed, one, two, four and six cylinder, four-cycle marine motors, new or rebuilt. Reliance Motor Boat Co., 210th Street and Harlem River, New York City.

BOSCH MAGNETOS—All types $15.00 each and up—Coils: Remy-Splitdorf—Delco and other types $5.00. Low Tension Magnetos all models $5.00 each and up. Presto Tanks $5.00—Lighting Generators $9.00. Starters. Carburetors. Switches. Steering Wheels, etc. Auto Motors, both water and air cooled all sizes. Write for late bargain bulletin second-hand Auto material suitable for all purposes. Johnston, West End, Pittsburgh, Pa.

WANTED—Elco or other good modern raised or bridge deck cruiser. 35 to 45 feet. Not over 50 H.P. Preference given to boat near Montreal, Canada. Write giving details, inventory, photograph, lowest cash price, etc. Box C, MoToR BoatinG.

WANTED—Small Cruiser, around 26-28 feet. V-bottom preferred. Hunting cabin. Must be staunch and fast and a bargain. Send photo or sketch and full particulars. Will consider offer hull only. J. H. Downing, 16 Middle Street, Portsmouth, Va.

Owner moved to California will sacrifice mahogany runabout. Boat just thoroughly overhauled, ready for launching. Furnished in wicker, excellent engine. Worth $2000 but will sell for best offer over $750. See Henry Halsted, Milton Point, Rye, N. Y.

WANTED—Bridge deck or raised deck Cruiser Hull. Must be in absolutely perfect condition. With or without engine. Kermath Manufacturing Company, Detroit, Mich.

FOR SALE—35-foot Hand V Bottom Cruiser with 50-70 H. P. Brennan motor; practically new. Would consider trading for a smaller boat. C. A. Donovan, 160 Berkeley Street, Lawrence, Mass.

FOR SALE—One hundred 8-cylinder motors 3" bore by 4½" stroke. Brand new and block tested. $100.00 each. New equipment including Atwater-Kent distributor and coil, Stewart carbureter, Dyneto starter and generator $100.00 extra. Regal Motor Car Co., 216 Piquitte Ave., Detroit, Mich.

WANTED—Reverse clutch in good order. Min. via shaft 1¾ in. 3 Blade Hyde or Columbia. "Ailsa-Craig" L. H. Wheel 24 in. dia. x 20 in. pitch. Give full details. Gordon Baxter, Palmyra, New Jersey.

FOR SALE by The Curtiss-Willis Co., 30 Church St., N. Y. 1—72 ft. 35 mile motor boat. New. Cost $55,000, price $27,500. 4—240 H.P. Diesel Engines, New. Cost $31,313, price $21,000. Also anchors, chain, slip blocks, wire rope, etc. Write us for discounts.

BARGAINS—Cabin and open launches, 16 to 35 ft. Prices from $100 to $300. 3 H.P. Ferro special, complete equipment. $35.00. Evinrude outboard motor, built-in magneto, $45. Write for description, E. W. Bennett, Southampton, New York.

FOR SALE—Four complete Make & Brake Ignitors, Rods, and Tripping Latches, with Low Tension Magneto for Standard 32-37 H.P. Marine Engine. Will fit any Standard motor. All $20.00. P. M. Child, 1110 14th St., N.W., Washington, D. C.

THIS SIX CYLINDER ENGINE WILL INCREASE SPEED of your boat. Vibrationless, economical, self-starting. 25 H.P. Immediate Delivery. Special price to introduce. Designers, 54 E. Lafayette Ave., Detroit.

Day Cruiser, "Martha II", 36 ft., 7 ft. 6 in. beam, 110 H.P. six cylinder Van Blerck motor, with starting and lighting outfit, fair haven mooring, tender, cradle, and all other accessories to make up a high class complete gentleman's outfit. Speed, 22 real miles per hour. Collingwood Mills, Third and Cambria Sts., Philadelphia.

High Speed Hulls, mahogany and cedar. Small up-to-the-minute Express and Water cars, suitable for 20 to 100 H.P. at exceptionally low prices. Bronx Boat Works, foot of Willow Ave. bridge, near East 132nd St., New York City.

Advertising Index will be found on page 112

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Opportunities for the Motor Boatman

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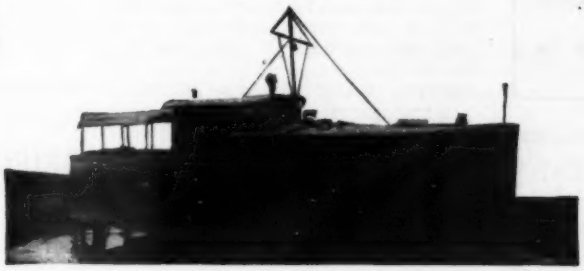
FOR SALE—IMMEDIATE DELIVERY.



EMMA BELLE II

Owned by Mr. Harry C. Stutz, Indianapolis. Designed and built by Great Lakes Boat Bldg. Corp.

A 38 Foot Shallow draft (semi-tunnel stern construction) Express Cruiser drawing only 24 inches of water. An ideal boat for Southern Cruising.

This boat, built in July, 1918, has only cruised 500 miles. Is in full commission, ready for immediate delivery. Mr. Stutz is having us build a larger boat, hence his reason for disposing of this one.

This boat is an excellent example of the Great Lakes Modified V-Bottom design, a real sea boat with splendid accommodations for her length. Arrangement consists of:—galley; main cabin with Pullman berths, handsomely upholstered in mohair velvet; completely equipt lavatory; full sized clothes locker; glass enclosed bridge deck; together with a protected after cockpit. Interior finish in mahogany throughout.

YOUR OPPORTUNITY TO GET A COMFORTABLE CRUISER NOW!

Wire or write for additional information, blueprints, etc. All enquiries will receive prompt attention.

GREAT LAKES BOAT BUILDING CORPORATION
MILWAUKEE, WISCONSIN

FOR SALE—18-2 H.P. 3 cyl. 2 cycle Rice engine, complete with clutch. 13 ft. shaft, 20 in. propeller, new A-K ignition. Overhauled, new P rings and bearings. Price $170. Gordon Baxter, Palmyra, N. J.

SALE OF U. S. NAVAL VESSELS (Motor Boats and Yachts)—Sealed proposals will be received at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock noon, May 1, 1919, when they will be publicly opened, for the purchase of the SEA HAWK, now at Key West, Florida; GREY FOX now at the Fifth District; POPE MARY now at Key West, Florida; THETIS now at New London, Conn.; TRAVELER now at Key West, Florida; ZIG ZAG now at Key West, Florida; HOWARDA now at Key West, Florida; VEGA now in the 4th Naval District. Exact location and permission to inspect may be had from the Commandant of the Naval District wherein located. Appraised values: SEA HAWK $15,000; GREY FOX $7,000; POPE MARY $5,000; THETIS $15,000; TRAVELER $4,000; ZIG ZAG $4,000; KANISED $12,000; GREY HOUND $3,500; HOWARDA $9,000 and VEGA $102,000. The sale will be for cash to the bidder offering the highest price above the appraised value. Forms of proposal and bond, and information concerning the vessels, and the terms and conditions of sale may be obtained upon application to the bureau of Supplies and Accounts. Josephus Daniels, Secretary of the Navy.

FOR SALE—25 ft. runabout, 17 H.P. Ferro motor. Gies reverse Columbian wheel. Anyone wishing such an outfit will do well by looking into this. Full details by mail. Austin D. Parker, 255 Bank St., Bridgeton, N. J.

Motor Boat, first class condition, used about six weeks. Herreshoff built, 46 ft. water line, 9 ft. 3 in. beam, 3 ft. 6 in. draft, oak frame, yellow pine planked and decked. 40 H.P. engine, U. S. Req. 13 tons. Mahogany deck house 30 ft. Complete equipment, 6 berths. Toilet, pantry, electric lights. Cushions, curtains. Taken in selling estate. Sell cheap. Address Motor Boat, B. Box 274, Portsmouth, N. H.

FOR SALE—Cabin Cruiser about 30 feet long, running water, electric lights, 2 cylinder, 2 cycle engine, 15 H.P., 2 gas tanks, cockpit snugly enclosed with awning, equipped with running lights, anchor, etc. E. P. Eaton, Sag Harbor, New York.

---

40 H.P. Heavy Duty, 4 cylinder, 6 x 8 Sintz, two cycle marine motor. Complete equipment, reverse gear, bronze shaft and wheel. In running condition and not junk. Weight 2800 lbs. F.O.B. Washington, D. C. $250.00. Carlisle & Finch, 7 in. brass marine arc pilot house control search lamp, with fly wheel dynamo to suit. $100.00. A few new small 8 in. 6 volt search lamps, all brass. $10.00. Davis & Child, 1110 14th St., N. W., Washington, D. C.

CRUISER 44 ft. x 9 ft. 3 in. x 28 in. 30 H.P. Ralaco engine 4-cylinder 4 cycle, has not run 500 miles. Full inventory. Beautiful boat, best design and finish. Would cost $14,000 to replace; will sell for $2,500. Owner has quit the game. Best bargain on the coast. Write for photo and description. No postals. S. M. Holman, 39 Pleasant St., Attleboro, Mass.

FOR SALE—One 20 H.P. Kermath 1918 engine with new K-W magneto with impulse starter, overhauled by us and guaranteed for one year the same as a new engine. A splendid bargain at $315.00. Kermath Mfg. Co., Detroit, Mich.

Marine and automobile engines 1 to 100 H.P. Best makes—good condition—very low prices. State your power needs. We take engines in trade. What have you? Magnetos, coils, carburetors, mechanical oilers, water pumps, etc. Also car parts of every nature—sacrifice prices. Write about your requirements.
Badger Motor Company, Milwaukee, Wis.

FOR QUICK DELIVERY, at low prices, high grade, heavy duty, marine crude oil engines of 40, 60, 75, 85, 112 and 150 B. H. P. Recent changes in owner's plans makes these engines available. Jacobson Engineering Co., 5 Second Ave., Rensselaer, N. Y.

MOTOR boat, 26 x 7, hunting cabin, fully equipped, toilet. Bedell's, Glenwood, L. I.

FOR SALE—Bull Dog Reverse Gear. Patterns, jigs, fixtures, stock of parts and all rights. Agents throughout U. S. & Canada. Can be had cheap. Write Atlas Machine Works, 797 St. Aubin Ave., Detroit, Michigan.

ENGINES—When buying a rebuilt engine get the best. United engines are rebuilt. Every engine fitted with new set famous Inland Gas-tight piston rings. Engines thoroughly tested and Guaranteed one year. Let us quote you before buying Write, United Motor Repair & Supply Company, 305-309 Broadway, N. Y.

WANTED—Good second-hand motor boat, 20 feet long, auto top and control, four cylinder, reverse gear, speed about 15 miles per hour. Address with photo, price and description. H. D. Wright, Gloversville, New York.

FOR SALE—Bargain—Six cylinder, 40-60 H.P. Pierce Budd speed engine, or might trade for medium duty engine. Ernest Merrow, Hyde Park, Mass.

Highest offer before May 1st takes 43 ft. x 9½ ft. cabin motor cruiser Jeannette, now at Portland Yacht Yard, Middletown, Conn., 24 H.P. 4 cyl., 4 cycle Palmer engine, sleeps six, large galley and toilet, electric lights. Complete cruising equipment. Address Wallace E. Mason, Normal School, Keene, N. H. See boat at Middletown, Conn., at any time. Advertised price last year $1600. Now, first check for $1100 or highest offer before May 1st.

GUARANTEED REBUILT ENGINES.
Sterling, 4-cylinder, 20-35 H.P.
Buffalo, 2-cylinder, 3-4 H.P.
Sterling, model FM, 6-cylinder, 85-125 H.P.
Murray & Tregurtha, 4-cylinder, 40 H.P.
Van Blerck, 8-cylinder, 115 H.P.
Fay & Bowen, 3-cylinder, 17 H.P.
Bridgeport, 2-cylinder, 15 H.P.
Speedway, 6-cylinder, 60-75 H.P.
Gray, 1-cylinder, 6 H.P.
All of above engines rebuilt and guaranteed in good running order. Send for our large list of rebuilt engines. Walter H. Moreton, 214 State St., Boston, Mass.

To Use Your Boat

(*Continued from page 9*)

rolled, licensed or documented in the Customshouses, (b) public vessels, (c) vessels less than 16 feet in length, temporarily equipped with detachable motors.

A registered boat is one supposed to do business in a foreign country, while enrolled and licensed boats are those which do business only in the United States. Licensed boats are of not more than 20 tons burden while all motor boats of more than 16 tons gross burden are documented and therefore exempt, and do not have to be numbered.

In the case of vessels having power tenders, the tenders will carry the same number as the parent boat and the cards will describe only the parent boat, stating the number of power tenders. In the case of documented boats having power tenders, the tenders will be described in a separate number given to each.

In case a motor boat is lost or destroyed or there is a change of ownership, notice of such must be furnished within ten days by the owners to the Collector of Customs and the districts where their numbers were awarded.

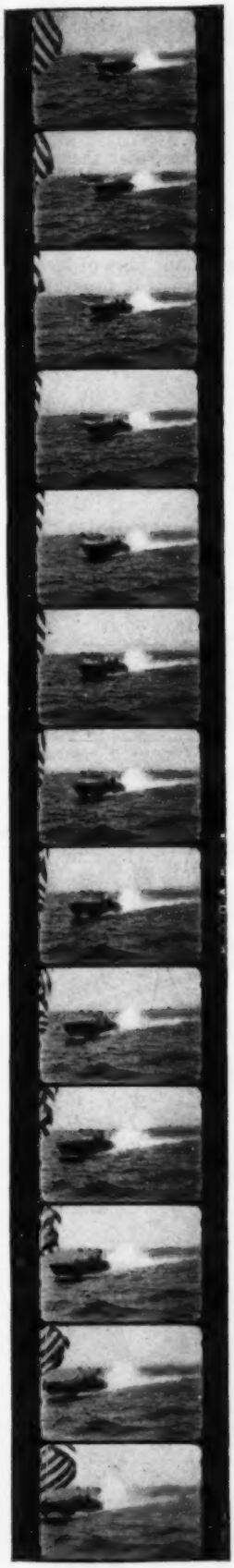
Although the present bill has been in operation only since December 7, 1918, and during a period when it is not to be expected that more than a small percentage of the existing boat owners would have made application for the numbers for their craft, owing to the fact that their boats were out of commission (although the law does not distinguish between a craft out of commission and one in commission), yet during the first ten weeks nearly 50,000 motor boats have been numbered. The chart on page 8 shows graphically the distribution of the boats numbered up to the middle of February. While it will be noted that there are several states in the central portion of the country where no boats have been numbered, yet it does not follow that there are no motor boats in these states. Numbers are required only on boats navigating the Federal waterways of the country. No numbers are required on boats navigating the waters under the jurisdiction of the State Governments, which explains the reason for no boats being numbered in a few of the inland states.

The war tax on motor boats is another point which is apt to cause the motor boatmen some worry, although if it is remembered that the new tax rate is just double the one of last year, no confusion should result.

The tax year begins on July 1 and ends on the following June 30. The new tax rate, that is, double the old rate, took effect on April 1, 1919, leaving the months of April, May and June in the present tax year. This means that the tax for three months, or one-quarter of the yearly rate, is due at the present time which must be paid before the boat is used. However, as most motor boatmen whose boats were in commission last season, have already paid their tax up to June 30, 1919, yet

(*Continued on page 64*)

Advertising Index will be found on page 112



Sea Sleds After the War

The war has done for the sea sled, what it has done for the airplane—carried through a development which otherwise would have been impossible within the line.

THE sea sled to-day is recognized as the only successful high speed motor boat for naval service.

The sea sled is the only safe and successful high speed boat for any service.

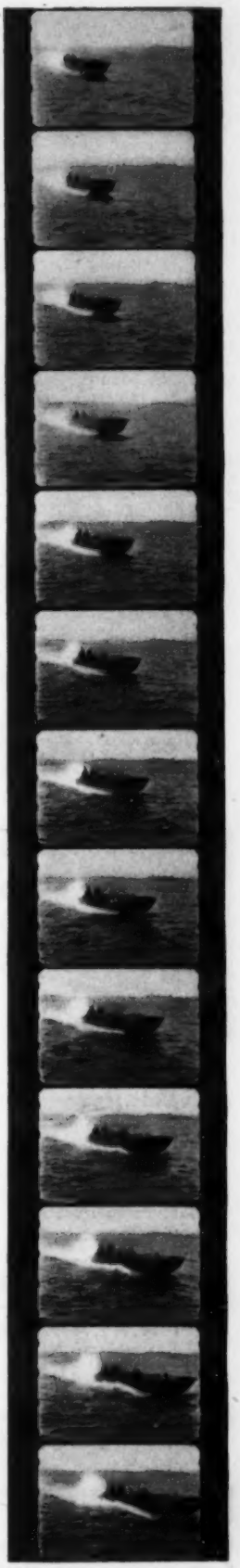
The sea sled is the only boat capable of running with speed unaffected in shoal water and through the heaviest weed growths.

In future all inquiries will be dealt with by:—

The SEA SLED COMPANY
Boston, Mass.

BOEING AIRPLANE CO.
Seattle, Wash.

VIPER CO., LTD.
Picton, Nova Scotia, Canada



Graphic Navigation

(*Continued from page 21*)

ELEVENTH STEP

Get the Azimuths of both stars.

Enter Azimuth Tables Number 71, with the assumed Lat. and the Hour Angle and Dec.

Subtract the Hour Angle from 24 if necessary to bring it within the limits of the table. Thus:

	$24^h\ 00^m$
t ★ Hamal	$20^h\ 15^m$
Equals t with which to enter table	$3^h\ 45^m$

Find by mental interpolation between Lat. 40° and 41° N. and the p.m. time between $3^h\ 40^m$ and $3^h\ 50^m$, for a Dec. of + 23°.

The Star Hamal bore east. This checks the approximate Azimuth found, — N. 92½° E.

Enter table with t of Star Altair, $2^h\ 30^m$, and Dec. + 8°.

Use same process of mental interpolation (in this case for Lat. only) and find Azimuth to be approximately N. 124° W.; this checks with the bearing N.W. by W.

It is not necessary to plot Azimuths closer than to the nearest half degree.

TWELFTH STEP

Plot the position on a chart.

From the Assumed Position lay off the lines of Azimuth and draw the positions lines perpendicular to them as indicated by the Altitude Difference.

The intersection of the lines of position will be the true position.

In this case the True Position is discovered to be Lat. 40° 1′ 40″ N. and Long. 69° 21′ 50″ W.

See Fig. 39.

FORM COMPLETE

Date, Nov. 10, 1918, p.m.
Lat. by D.R. 40° 30′ N.
Long. by D.R. 69° 25′ W.
C — W, $5^h\ 25^m\ 15^s$
C.C. — 5^s
Height of eye, 42 feet.
I.C., 0.

W.T.	6^h	12^m	10^s	Obs. Alt. ★ Hamal	40°	4′ 50″
C — W	5^h	25^m	15^s	Corr.	—	7′ 30″
Cro. t	11^h	37^m	25^s	Obs. h	39°	57′ 20″
C.C.		—	5^s			
G.M.T.	11^h	37^m	20^s	R.A.M.S. for G.M.N.	15^h	15^m $20^s.1$
R.A.M.S. at G.M.T.	15^h	17^m	15^s	Corr.	+	1^m $54^s.5$
G.S.T.	26^h	54^m	35^s	R.A.M.S. for G.M.T.	15^h	17^m $14^s.6$
λ W	4^h	37^m	40^s	or	15^h	17^m 15^s
L.S.T.	22^h	16^m	55^s			
R.A. ★ Hamal	2^h	2^m	38^s			
t	20^h	14^m	17^s	Log. Hav.	9.34931	
Lat. 40° 30′ N.				Log. Cos.	9.88105	
Dec. + 23° 4′ 54″				Log. Cos.	9.96376	
				Log. Hav. θ	9.19412	
				Nat. Hav. θ	.15635	
Lat. ~ Dec. 17° 25′ 6″				Nat. Hav.	.02292	90° 0′
				Nat. Hav. z	.17927 =	50° 6′
				Cal. h		39° 54′ 00″
				Obs. h		39° 57′ 20″
				Alt. Diff.		3′ 20″ Go to.

W.T.	6^h	14^m	22^s	Obs. Alt. ★ Altair	43°	57′ 10″
C — W	5^h	25^m	15^s	Corr.	—	7′ 21″
Cro. t	11^h	39^m	37^s	Obs. h	43°	49′ 49″
C.C.		—	5^s			
G.M.T.	11^h	39^m	32^s	Z Hamal	N. 92°.5	
R.A.M.S. at G.M.T.	15^h	17^m	15^s	Z Altair	N. 124 W.	
G.S.T.	26^h	56^m	47^s			
λ W.	4^h	37^m	40^s			
L.S.T.	22^h	19^m	7^s			
R.A. ★ Altair	19^h	46^m	50^s			
t	2^h	32^m	17^s	Log. Hav.	9.02684	
Lat. 40° 30′ N.				Log. Cos.	9.88105	
Dec. + 8° 39′ 24″				Log. Cos.	9.99502	
				Log. Hav. θ	8.90291	
				Nat. Hav. θ	.07997	
Lat. ~ Dec. 31° 50′ 36″				Nat. Hav.	.07526	90° 00′ 00″
				Nat. Hav. z	.15523 =	46° 24′ 23″
				Cal. h		43° 35′ 37″
				Obs. h		43° 49′ 49″
				Alt. Diff.		14′ 12″ Go to.

(*Continued on page 90*)

To Use Your Boat

(*Continued from page 60*)

this was figured at the old rate which amount already paid will naturally be credited to the owner in the payment of his tax at the new rate for the period from April 1, 1919, to June 30, 1919. This credit will amount to just half the tax due for this three months' period, for example, on a boat of less than five net tons burden on which the old tax had been paid, the new tax due will be $1.25. ($2.50 — $1.25 = $1.25.)

The table on page 94 shows the different tax rates on the different sizes of boats.

It will be remembered that tonnage is found by multiplying the length of the boat in feet by its breadth multiplied by its depth (from deck to top of keel) and multiplied by six-tenths. This product divided by 100 gives the gross tonnage. To determine net tonnage deduct from the above mentioned gross tonnage the following:

The spaces appropriated to the use of the crew and master, including sleeping and living quarters, galley, toilet and wash rooms, space occupied by anchor gear, storage of sails, charts, signals and other instruments of navigation and boatswains' stores, provided they are reasonable in extent, used solely for the purposes designated.

In addition to the above deduct the propelling power space. When the propelling machinery is located in the cabin or a compartment that is used for other purposes, the machinery space, the basis for propelling power allowance, is to be considered the space occupied by the engine and sufficient space on each side for handling it safely and efficiently, otherwise allow whatever space there is. Fuel tanks and bunkers, storage batteries, or other engine accessories are not to be included in the machinery space.

The terms master and crew apply only to those employed in the navigation and care of the vessel; the owner, if not sailing master, and guests are to be considered passengers.

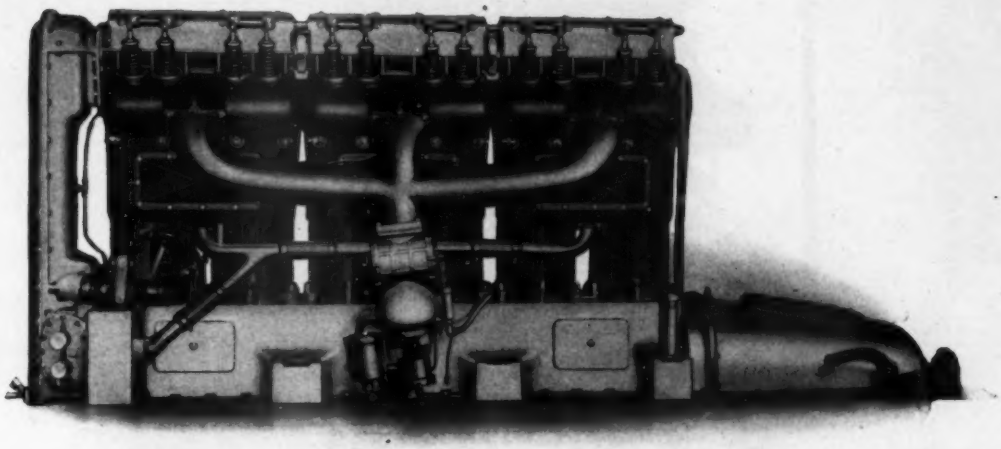
PORTS WHERE NUMBERS ARE ISSUED AND LETTERS ALLOTTED TO CUSTOMS DISTRICTS.

Port	Letters Assigned	Port	Letters Assigned
Portland, Me.	AB	Pittsburgh, Pa.	V
Boston, Mass.	CDE	Indianapolis, Ind.	K
Providence, R. I.	FG	St. Louis, Mo.	X
Bridgeport, Conn.	HJ	Des Moines, Ia.	H
New York, N. Y.	*K	Omaha, Neb.	Y
Philadelphia, Pa.	LM	St. Paul, Minn.	Z
Baltimore, Md.	NP	Pembina, N. D.	J
Norfolk, Va.	RS	Great Falls, Mont.	G
Wilmington, N. C.	T	Cleveland, Ohio	N
Charleston, S. C.	U	Detroit, Mich.	PR
Savannah, Ga.	U	Chicago, Ill.	ST
Tampa, Fla.	VW	Milwaukee, Wis.	W
St. Albans, Vt.	X	Duluth, Minn.	U
Ogdensburg, N. Y.	Y	Los Angeles, Cal.	A
Rochester, N. Y.	Q	San Francisco, Cal.	BCDEF
Buffalo, N. Y.	Z	Portland, Ore.	GHJ
Mobile, Ala.	A	Seattle, Wash.	KLM
New Orleans, La.	BC	San Juan, Porto Rico	FG
Port Arthur, Tex.	D	Honolulu, Hawaii	XY
Galveston, Tex.	E	Juneau, Alaska	TU
San Antonio, Tex.	F		
Memphis, Tenn.	M		
Louisville, Ky.	L		

*Numbers will be awarded up to 9,999 without a letter. Additional numbers, if required, will be used in connection with the letter K.

(*Continued on page 94*)

Advertising Index will be found on page 112



Announcement

A change in organization

The Murray & Tregurtha Corporation, of Atlantic, Mass., has been formed to develop the growing business of the well-known Murray & Tregurtha Company, which has been building high-grade marine engines and yachts for the past thirty years.

The personnel of the former organization has been strengthened materially by acquiring some of the best talent in the marine engine field.

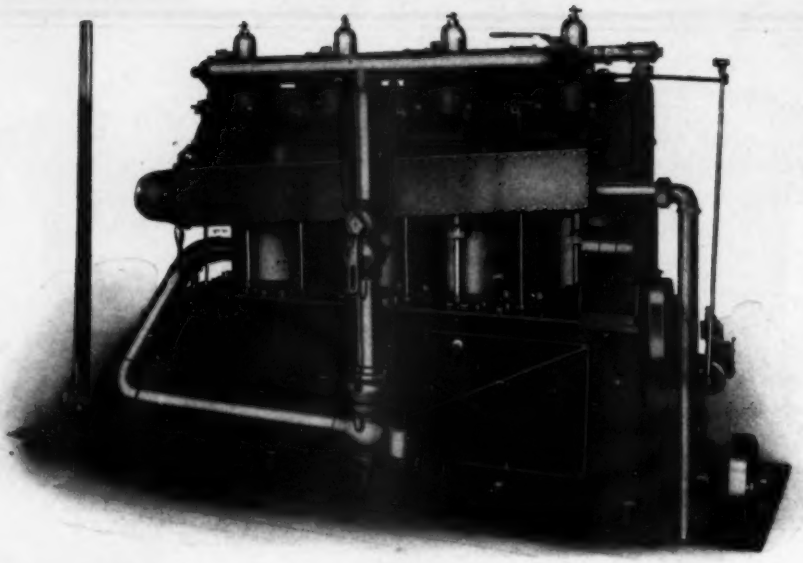
Plans and Products

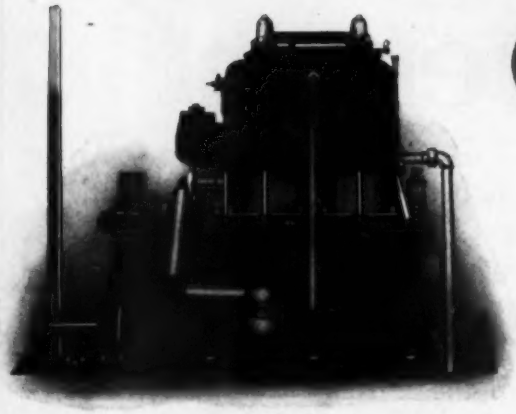
The new organization has eliminated the yacht building department of the old company; the entire facilities will be used in producing in large quantities the well-known Murray & Tregurtha Marine Engines, in both the high speed and heavy duty types.

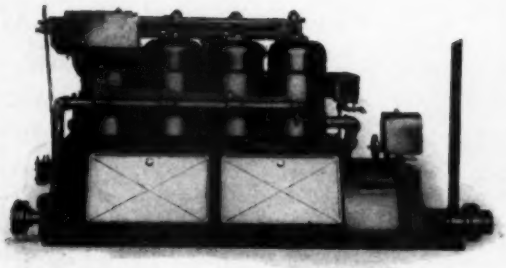
We have an attractive proposition to offer boat builders and naval architects. Let us tell you about it.

Murray & Tregurtha Corp.

Atlantic, Mass.







Murray & Tregurtha Heavy Duty Marine Engines

We will continue to build the following sizes of the *old reliable* Murray & Tregurtha Heavy Duty Marine Engines.

We list below the principal specifications of these motors which are in production —it takes our complete catalog to even partially describe their many good features.

Model E-2, 2 cyl, Bore 6¼, Stroke 8, 18 H.P. at 425 R.P.M. . . . $1000.00 F.O.B. Factory
" E-3, 3 cyl, Bore 6½, Stroke 8, 28 H.P. at 425 R.P.M. . . . $1600.00 F.O.B. Factory
" E-4, 4 cyl, Bore 6½, Stroke 8, 40 H.P. at 450 R.P.M. . . . $2200.00 F.O.B. Factory
" E-6, 6 cyl, Bore 6½, Stroke 8, 60 H.P. at 450 R.P.M. . . . $3250.00 F.O.B. Factory
" F-4, 4 cyl, Bore 7½, Stroke 10, 60 H.P. at 375 R.P.M. . . . $3000.00 F.O.B. Factory
" F-6, 6 cyl, Bore 7½, Stroke 10, 100 H.P. at 450 R.P.M. . . . $4500.00 F.O.B. Factory

Definite standardization of manufacturing methods has enabled us to produce the above engines in large quantities and to incorporate in the manufacture of these engines the best of materials obtainable and the highest grade of workmanship.

Murray & Tregurtha Corp.
Atlantic, Mass.

Advertising Index will be found on page 112

Why Should I Own a Motor Boat?

(*Continued from page 12*)

flesh ever could be doctored up. All lines of merchandising unfortunately have pilferers of this stripe and the motor boat industry is not immune. There are many good boats and motors put up for sale second-hand that are reliable in every way but unfortunately the age of a boat or even of a motor is not a reliable index of its present worth. A good boat will give many years service and look well if given proper care and this applies with equal truth to the well-built marine motor. But both may be only a few years old but having been carelessly used are wracked beyond repair and very naturally the pleasures of motor boating cannot be well enjoyed in boats of this kind. And whatever type of boat you may wish to own, either new or second-hand, it will be always well worth while to purchase from a reliable company, unless, of course, you happen to know the craft and the owner who wishes to dispose of it. There are so many dependable men in the motor boat field that it is easy to buy just the boat you want at a fair price, and such a craft will prove a sound investment, and motors and all accessories can be likewise purchased to the same good advantage. If you happen to want advice, write to the Service Department of MoToR BoatinG, but do not buy a boat or motor on a mere gamble.

There are no Fords as yet in the motor boating field but there is a good variety of small and inexpensive craft to choose from and no matter what your specifications may call for, I am pretty confident you will find a boat to fully measure up to your ideas without difficulty. There is as wide a range in model, finish, power and price in motor craft as you will find in motor cars. If you happen to want a plainly finished boat with a reliable medium-power motor, you can select a boat from one of several designs and you will get all boat value at the price you elect to pay. Not so many years ago it was difficult to buy a cruiser or any but the one stock model, unless to special order, which meant an increased price to pay for designing a boat to your order. Today practically all of the larger boat builders carry stock boats in a large variety of designs, lengths and finishes and as many builders specialize in various types of boats —speed craft, cruisers, runabouts, etc., the motor boat market affords a very complete line of standardized boats, ranging in length from the sixteen-footer all the way up to the fifty- or sixty-foot cruiser. If you want a plainly finished boat of one of several different types with either a medium-powered motor or a high-speed power plant, you can buy it ready to run and delivered promptly. And if your ideas call for a mahogany planked hydroplane for either racing or runabout use you can quickly have it, and a luxurious cruiser of the express or of the deep-sea type and all other designs, from

(*Continued on page 70*)

Advertising Index will be found on page 112

Statement of the Ownership, Management, Circulation, etc., required by the Act of Congress of August 24, 1912, of MoToR BoatinG, published monthly at New York, N. Y., for April 1, 1919. State of New York, County of New York, ss. Before me, a Notary Public, in and for the State and county aforesaid, personally appeared C. F. Chapman, who, having been duly sworn according to law, deposes and says that he is the Business Manager of MoToR BoatinG, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit: 1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, International Magazine Company, 119 West 40th St., New York, N. Y.; Editor, C. F. Chapman, 119 West 40th St., New York, N. Y.; Managing Editor, C. F. Chapman, 119 West 40th St., New York, N. Y.; Business Manager, C. F. Chapman, 119 West 40th St., New York, N. Y. 2. That the owners are: International Magazine Company, 119 West 40th St., New York, N. Y.; Stockholders, W. R. Hearst, 137 Riverside Drive, New York, N. Y.; M. V. Hearst, 137 Riverside Drive, New York, N. Y. 3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: Columbia Trust Company, 60 Broadway, New York, N. Y.; M. V. Hearst, 137 Riverside Drive, New York, N. Y.; W. R. Hearst, 137 Riverside Drive, New York, N. Y.; Arthur Brisbane, 238 William St., New York, N. Y.; Lina Strauss, 27 West 72nd Street, New York, N. Y.; George J. Gould, 165 Broadway, New York, N. Y.; E. H. Gary, 856 Fifth Avenue, New York, N. Y.; Samuel Untermyer, 37 Wall Street, New York, N. Y.; George W. Perkins, 71 Broadway, New York, N. Y.; James Speyer, 1038 Fifth Avenue, New York, N. Y. 4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. C. F. Chapman, Business Manager. Sworn to and subscribed before me this 31st day of March, 1919. (Seal.) Thorolf O. Machel, Notary Public, Kings County. (My commission expires March 30, 1921.)

Advertising Index will be found on page 112

Why Should I Own a Motor Boat?

(*Continued from page 68*)

the little dory up the scale to the completely furnished cruiser can be as readily purchased.

Buying a boat is easy and somewhat difficult, depending entirely upon whether you happen to know the good points of hull and motor or have yet to learn their good features. The particular use for which you want to use the craft is, of course, the chief factor for there is a type of boat which will best serve you under the conditions you have in mind. To choose any other boat than this is to fail to take full advantage of the motor boat market and enjoy the great sport under less favorable conditions than you are required to. A good boat especially well suited for your needs, powered with a reliable motor especially designed to drive it smoothly and economically, is the logical choice. You can enjoy motor boating with a less perfectly balanced outfit than this, but as there is no reason why you should do so, a little careful discrimination while purchasing will result in owning a fine outfit for the sport and you will find the fullest measure of satisfaction without experiencing trouble of any kind.

The best boat for your particular use is to a large extent a personal decision, because personal opinion enters to decide not only how much you want to pay but what finish you shall choose. The design or model best adapted for your needs may be considered to a certain extent also a personal question, insofar as there are many variations of the general type. However, boats are bought much as motor cars are purchased by picking the best type for your purpose. And boats are conveniently divided into several prominent classes with many variations of design in each class. For fast traveling there is the racing or speed type which may be subdivided into the regular hull and the hydroplane form with one or more steps. In the cruising type there are likewise many forms of designs; the fast high-powered express cruiser type and the medium- and slow-speed boats for inland or sheltered waters and deeper boats with more beam for rough water and deep-sea cruising. The runabout class is replete with the greatest variety of designs, because it is the most popular and all-around motor boat. In this class are found many designs for fast traveling, medium-speed boats and the low-speed craft powered with a single cylinder motor. And the best advice I know of to the purchaser of a boat is to first become reasonably well posted on the many good designs offered by our representative builders and when the boat type is decided upon, buy the best boat you can afford of its class. A good boat, like all other merchandise, is always sold at a fair price. You can purchase a piano for little more than a hundred dollars but not a first class one for this amount. It is the same with motor cars and with motor boats,

(*Continued on page 72*)

50-foot Cruiser

Boats That Express Individuality

These six standardized models of Albany Craft are the result of building boats that have given satisfaction to a distinguished clientele of prominent yachtsmen—and the United States Government.

These standard types, as well as our custom work, are finished to express client's individuality.

Interesting descriptive brochures are prepared for each model.

40-foot Day Cruiser

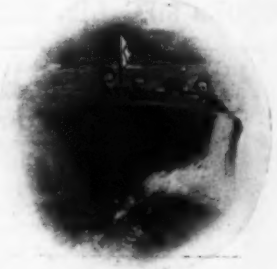
26-foot Runabout

Albany Boat Corporation

Watervliet, N.Y.

Albany BOATS

36-foot Cruiser



35-foot Express Runabout

30-foot Fast Runabout

To Manufacture Marine Motors By Up To Date Production Methods

(*Continued from page 44*)

the best versed men in the marine engine and yachting field and needs no further introduction. Many hundreds of motor boatmen are already personally acquainted with Mr. Murray as his supervision of the business of the old company put him into contact with every owner of a Murray & Tregurtha motor. Mr. Murray took great pride in this personal service as he called it and that there is not one dissatisfied M. & T. owner to be found today is the result of the combination of a high grade marine motor and a president who cared.

Otis C. Funderburk. the first vice-president and chief engineer of the new organization, is recognized as one of the leading engineers on internal combustion engines. Mr. Funderburk is a graduate mechanical engineer and has spent the last twenty years in the designing and building of high-speed gas engines and has also made very exhaustive experiments on carburetion specialties. In carbureters alone, he has been granted fifty-four United States patents and his designs and improvements are used on all the best known carbureters. Mr. Funderburk has complete charge of all engineering and production for the new organization.

Frank B. Sexton, the second vice-president in charge of sales, service, and advertising for the new corporation, is well-known in the marine engine field, having occupied a similar position with the Van Blerck Motor Company for a number of years. Mr. Sexton has been engaged in the manufacturing and selling end of the marine engine business for over twenty years and for this reason is well fitted to take hold of the company's plans for expanding its business.

Linus C. Coggan, the secretary and treasurer of the new organization, is a very well-known New England attorney. Mr. Coggan has been the attorney for the Murray & Tregurtha Company for a number of years and succeeded to the position of treasurer and counsel on the death of the former treasurer, Mr. William Tregurtha, in the early part of 1917.

Why Should I Own a Motor Boat?

(*Continued from page 70*)

the best will cost you more. For a certain amount you can own a well constructed and correctly designed hull and install a dependable motor, and you cannot purchase a good boat for less than this. This will give you all boat value for your money, and if you want a finer finished craft you can pay as much as you like for mahogany or teak or elaborate decorations. You will have a more beautiful craft but the boat will neither be more comfortable nor speedy because of its finer finish.

Advertising Index will be found on page 112

Safety Suits That Really Save At Sea

(*Continued from page* 36)

"The buoyancy consists of thirty-four ounces of prime Japara Kapok, divided into three sections; one in front containing twenty ounces, one at the back containing eleven ounces, and one about the head and neck containing three ounces. The latter is arranged to close about the face with drawstrings in such a manner as to make the suit absolutely water-tight.

"The suit can be ventilated at any time the wearer desires as the entire head may be uncovered and the suit left open at the neck by the drawstring adjustment.

"This suit can be put on in less than a minute, and is intended to be used as an emergency suit, and as such will float any person either in an upright position or lying on his back. The buoyancy is so placed and co-ordinated with the weights in the feet that if the wearer should become inert his body would immediately turn face up and remain in a semi-upright position, the Kapok at the back of the neck and head holding the head high out of water.

"The balance between the weights and Kapok is such that any person can stand upright or lie down at will, thus insuring the maximum of comfort if a person is obliged to spend hours in the water. It is also possible to swim in this suit almost as rapidly as in a bathing suit, which would enable one to get away from a sinking ship and avoid being drawn under with the suction or entangled among floating wreckage.

"As this suit is air- and water-tight, it will keep the wearer dry and warm. The fabric is practically a non-conductor, therefore all bodily heat is kept within the suit and the wearer suffers no serious discomfort even though in icy water for hours.

"The head is fully protected by a hood and secures the same bodily heat as the rest of the body. In case of the wind blowing up an icy spray this is very important. The hood is also well surrounded with soft Kapok and the neck muscles may be perfectly relaxed when the wearer lies down and he could go to sleep with safety.

"In effect, the suit is a bag closing with a draw-string, the adjustments of which are very simple. It has but one opening, which is at the top, no valves nor springs to get out of order; no metal parts to rust, bend or break.

"While intended primarily to be used as a life saving suit in the generally accepted use of that term, it is soft and pliable and can be worn at any time as protection against the cold, rain and inclement weather, and as it is constructed of very durable material it will stand the maximum of wear and still be safe as a life preserver should an emergency arise. The soles would probably outwear the average sole of a rubber boot."

THE SENSIBLE SAFETY SUIT

SIMPLICITY is the chief characteristic of this suit, according to its inventor, who says:

(*Continued on page* 76)

Advertising Index will be found on page 112

Safety Suits That Really Save At Sea

(*Continued from page 74*)

"It is simply a water-proof, rubberized, strong double fabric garment onto which is attached a life preserver. It is put on over the clothing and covers the body with the exception of the hands, feet and head. At the lower or ankle fastening an absorbent cotton felt pad is incorporated to insure, if one is long in cold water, that capillarity, that subtle but powerful force of nature, will surely effect the slow admission of moisture or water which, being unconsciously warmed by the wearer as it is slowly soaked up by the clothing, protects his body from the cold water of the ocean.

"It is open down the front to the crotch like a union suit. Inside of this opening in the body of the suit is a water-tight bellows which automatically closes itself water-tight at the top when folded into place. The two edges of the opening itself are closed their entire length with one pull of a string by the well known 'Hookless Fastner.' No water, therefore, can enter from the ankles to the neck. The neck is adjustable and made tight as to wind, spray and waves but designedly is not air-tight.

"The life preserver is made of large but thin Kapok pads which conform comfortably to the shape of the body from the hips to the neck and are buttoned into ventilated weather-proof compartments on the outside of the suit. They are therefore readily removed when desired.

"The United States has already granted over 200 patents on life saving garments, yet every other life saving suit devised has had the fundamental aim and object of being absolutely water-tight and of keeping the body and clothing perfectly dry, thereby giving the inventors of the patents under which the Sensible Safety Suit is made a clear field in the use of water for conserving the body heat. Why this was, it is hard to say when all the scientific world has known for generations that water is the best attainable substance for storing heat. One cubic inch of water in the clothing holds over 3,400 times as much heat as the cubic inch of air it displaces. In addition to its superior heat storing capacity water is one of the best known non-conductors of heat.

"The weight of the whole suit, including the life preserver, is less than nine pounds. No counterweights are used in it, and having no iron frame it is easily packed into small space. It is furnished in a neat, strong canvas bag.

"While Kapok, the material now universally used for life preservers, will not, if immersed in water, become saturated for many days, yet it will absorb perspiration and very soon become foul and offensive.

"This condition is practically certain to obtain where the Kapok is enclosed within a life saving suit. So far as I know, the Sensible Safety Suit is the only life saving suit that is free from this very serious objection."

Advertising Index will be found on page 112

DELCO-LIGHT MARINE SET

Make your motor boat trips at night a real pleasure.

The DELCO-LIGHT MARINE SET assures electric light and power just when and where you need it.

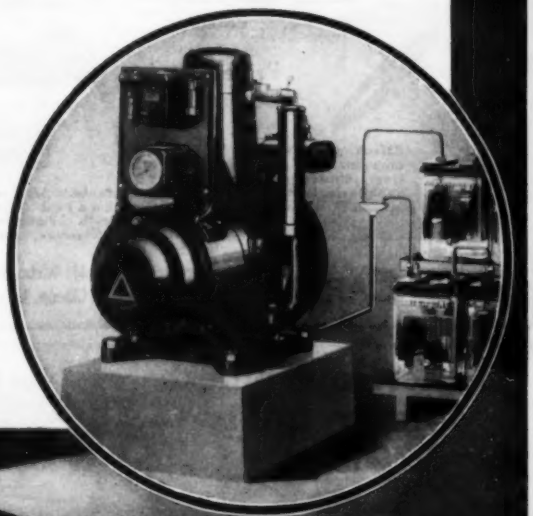
The cabin or sleeping quarters may be electric lighted; also well ventilated by electric fans.

Even hot lunches may be prepared aboard by chafing dish and percolator.

Motor boat engines may be easily cared for with the aid of a portable electric light.

A complete electric light and power plant for Motor Boats, House Boats and Summer Cottages.

Self-cranking — air-cooled — ball and roller bearings — no belts — only one place to oil — thick plate, long lived battery.



RUNS ON KEROSENE

THE DOMESTIC ENGINEERING COMPANY
Makers of DELCO-LIGHT Products
DAYTON, OHIO, U. S. A.

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Graphic Navigation

(*Continued from page 62*)

Get the angular difference between the Right Ascension and the Local Sidereal Time, that is, subtract the less from the greater, the remainder will be the Hour Angle (t). Thus,

L.S.T. first sight	22h	16m	55s	
R.A. ★ Hamal	2h	2m	38s	rejecting the .1s.
t	20h	14m	17s	

Declination ★ Hamel, + 23° 4′ 54″.

L.S.T. second sight	22h	19m	7s	
R.A. ★ Altair	19h	46m	50s	calling 49s.8, 50s.
t	2h	32m	17s	

Declination ★ Altair + 8° 39′ 24″.

See Fig. 34.

EIGHTH STEP

Having all parts, proceed to computation. Use the Cosine Haversine formula. See Saint Hilaire method in last issue.

t ★ Hamal, 20h 14m 17s	Log. Hav.	9.34931
Lat. of assumed position, 40° 30′ N.	Log. Cos.	9.88105
Dec. + 23° 4′ 54″	Log. Cos.	9.96376
	Log. Hav. θ	9.19412
	Nat. Hav. θ	.15635
Lat. ~ Dec. 17° 25′ 6″	Nat. Hav.	.02292
	Nat. Hav. z	.17927

Equals Calculated Zenith Distance, 50° 6′

t ★ Altair, 2h 32m 17s	Log. Hav.	9.02684
Lat. of assumed position, 40° 30′ N.	Log. Cos.	9.88105
Dec. + 8° 39′ 24″	Log. Cos.	9.99502
	Log. Hav. θ	8.90291
	Nat. Hav. θ	.07997
Lat. ~ Dec. 31° 50′ 36″	Nat. Hav.	.07526
	Nat. Hav. z	.15523

Equals Calculated Zenith Distance, 46° 24′ 23″

NINTH STEP

Get the Calculated h of both stars.

90° minus the Calculated Zenith Distance equals the Calculated h.

	90°	00′	00″
Cal. z Hamal	50°	6′	
Cal. h	39°	54′	00″

	90°	00′	00″
Cal. z Altair	46°	24′	23″
Cal. h	43°	35′	37″

TENTH STEP

Get the Altitude Differences of both stars. See Fig. 38.

The Altitude Difference is the remainder after subtracting the less h from the greater.

If the Obs. h is greater than the Cal. h, lay off the Alt. Diff. along the line of Azimuth, toward the body from the assumed position.

If the Obs. h is less than the Cal. h, lay off the Alt. Diff. along the line of Azimuth, away from the body from the assumed position.

Obs. h ★ Hamal	39°	57′	20″
Cal. h ★ Hamal	39°	54′	00″
Alt. Diff.		3′	20″

Obs. h ★ Altair	43°	49′	49″
Cal. h ★ Altair	43°	35′	37″
Alt. Diff.		14′	12″

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Advertising Index will be found on page 112

To Use Your Boat This Summer

(*Continued from page 64*)

Amount of Taxes on Use of Motor Boats

Size of Boat	Amount of Tax April 1 to June 30, 1919	Amount of Tax July 1, 1919, to June 30, 1920	Total Tax Payable at once (to June 30, 1920)
Under 5 net tons.....	$2.50*	$10.00	$12.50
Over 5 net tons under 50 feet L. O. A., per foot of length	.25*	1.00	1.25
50 feet to 100 feet, per foot of length.....	.50*	2.00	2.50
Over 100 feet in length, per foot of length..	1.00*	4.00	5.00

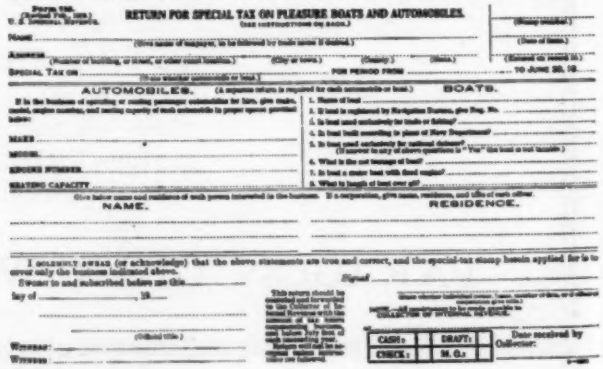
*Note: If tax was paid in 1918 you will have a credit of one-half the amount indicated by the *, therefore your tax up to June 30, 1919, will be the difference, or also one-half of the amount indicated by *.

Important: If you do not use your boat during the tax year or do not place her in commission, then no tax will have to be paid. A boat used once or more is taxable at the yearly rate.

Table Showing Number of Motor Boats

	Motor Boats Numbered	Gasoline Yachts Documented	Commercial Gasoline Yachts Documented
Maine	2,674	29	559
New Hampshire	....	..	7
Vermont	90	6	1
Massachusetts	2,248	98	541
Rhode Island	1,245	14	193
Connecticut	1,282	32	201
New York	7,440	345	998
New Jersey	....	10	152
Pennsylvania	2,318	118	411
Delaware	....	10	46
Maryland	4,700	32	274
District of Columbia	....	13	6
Virginia	2,600	7	596
North Carolina	2,201	4	323
South Carolina	284	6	150
Georgia	320	7	61
Florida	5,110	81	499
Alabama	574	3	79
Mississippi	....	1	60
Louisiana	1,496	16	256
Texas	740	13	240
Porto Rico	....	2	8
Tennessee	258	3	86
Kentucky	154	..	125
Missouri	1,738	10	230
Nebraska	66	..	5
North Dakota	1	..	38
Montana	....	..	11
Iowa	1,129	2	42
Minnesota	669	7	33
Wisconsin	490	27	295
Michigan	896	49	302
Illinois	1,525	43	132
Indiana	205	1	42
Ohio	743	15	96
California	2,476	24	629
Oregon	2,326	2	247
Washington	1,685	45	1,333
Alaska	....	..	561
Hawaii	....	2	23
Total	49,683	1,077	9,891

Note: The reason that no boats are recorded in some states in the above list is that boats in those states are numbered in other states.


RETURN FOR SPECIAL TAX ON PLEASURE BOATS AND AUTOMOBILES.
AUTOMOBILES. BOATS.
NAME.
RESIDENCE.

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Two Men, a Maid and a Boat

(*Continued from page 32*)

succeeded. She wabbled around in a scandalous way, finally heading straight for Boojum. Desperately we hauled our boat out to its anchor. Full tilt she bore down upon us, gaining speed as she came. Despairing of saving Boojum we prepared to jump, when just then the sloop, caught in a current of wind, swung about and wabbled weakly up the river.

The water outside looked quieter, and deciding to venture forth again we left Sakonnet at 4 o'clock. Outside a stiff wind was blowing, kicking up quite a sea. We kept going, nevertheless, spurred on by our desire to make Newport that night. We were running at slow speed straight into the face of the setting sun, and the glare on the water was so great that we could hardly see where we were headed. In consequence we picked up a good deal of seaweed and had to shut down the engine to clear the wheel. We passed to the west of the tossing light-ship of Brenton's Reef and about 5 o'clock turned into Narragansett Bay. The water of the Bay was perfectly calm, and Boojum just ate it up—her speed was terrific—or so it seemed to us after creeping in rough water from Sakonnet. Almost weeping from relief we broke the silence we had maintained all the way from Sakonnet, with a duet entitled "Good Old Boojum, See Her Go."

On entering, we found Newport Harbor full of yachts and government boats. The bored-looking sailors hailed us with delight, so, of course, we sped around the harbor just to show them what we could do. We anchored then, fairly close to shore, and while Bayard dressed and went ashore to get supplies, I spread my blankets on the cockpit floor, rolled into them and fell asleep. I had always wanted to visit Newport; here I was now within a stone's throw of it, and too weary to dress and go ashore. I didn't even have any regrets at not seeing it. My blankets completely satisfied me. At 8:30 o'clock the bump of the returning Seive awakened me. Bayard had bought ice-cream and chocolate almonds. We ate that mess, drank some soup, unfurled our mattresses and retired.

It was a beautiful, starlit night; the harbor was alive with brilliantly lighted boats; we fell asleep in our seagoing cradle listening to the sound of a distant band and the roar of fireworks. About midnight I waked up coughing and sneezing, and after that our sleep was fitful. At five the dolorous wail of the fog horn and the constant ringing of the fog-bells roused us. Finding we were surrounded by a thick mist we turned over and went to sleep again. At seven we got up and got our breakfast. By noon, when we started ashore, it had cleared up so that we could see across the harbor, but outside the fog-horn still blew drearily.

Our first visit in Newport was to an art exhibit, where we saw a good many more or less interesting marines, some beautiful pottery and had tea and cake with the wife of the artist. Leaving the studio we walked down the cliff walk, but an approaching shower drove us back to Thames Street, there to collect our purchases and seek a bottle of milk. Failing in our search we returned to Boojum, praying for a clear day.

The next morning found us still fog-bound. We spent the morning scrubbing, polishing and petting the engine. In the afternoon we walked out to Bailey's Beach. We could see only about 300 feet out to sea; the heavy, incoming waves breaking against the cliffs sent great columns of spray over the cliff-walk. To our great disappointment only the servants of Newport were bathing. At the beach we met and talked with a coast-guard, a blue-eyed youngster with an immovable upper-lip who offered to walk us across Bailey's Beach. Bayard, in his best class-conscious manner, declined.

At 9 o'clock we were ready for bed, and before going I stuffed my nose with capsicum vaseline. In a very short time we were up applying good old boat remedies, machine-oil, sea-water and hard grease, to stop the burning. After daybreak Newport Harbor is so noisy that sleep is out of the question, and, as usual, we were awake at 5:30. The fog-bells and horns were still sounding their miserable duet and disgruntled and unhappy at our enforced stay at Newport, we tossed and turned for another hour, saying with every turn, "Well we'd better get up."

(*To be continued*)

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Frisbie an' I

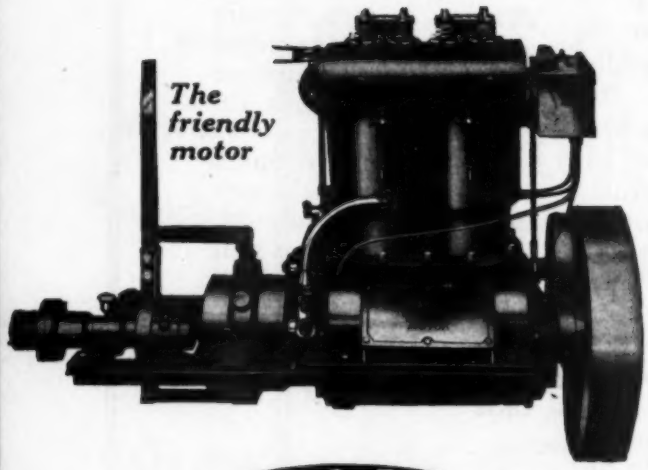
—we buck rough seas for 300 MILES WITHOUT A "MISS"!

"I CONSIDER the Frisbie the best, most reliable marine motor it is possible to install in a boat. If I ever get a new boat, it will be powered with a 'Frisbie,'" says H. W. Gaines, 52 E. Washington Lane, Philadelphia.

Mr. Gaines cruised in the "Ruth G" from Washington, D. C., to Philadelphia, 326½ miles, and his Frisbie Motor fired both cylinders every revolution of the trip! Average speed, 40 miles a day; 63 gallons of gas for the trip.

Nasty seas most of the time — waves sometimes vaulted over the cabin roof. Mr. Gaines, who counted the revolutions every half hour, says the motor did not vary five revolutions during the trip, unless he changed the spark or throttle!

Isn't it worth your while to let us send you complete facts about a motor that does things like this?



Frisbie VALVE-IN-HEAD MOTOR

A Friendly Family of Friendly Motors

There is a medium-duty Frisbie for every purpose. 1 cyl., 5 and 7 H.P., 4 cycle; 2 cyl., 10 and 16 H.P.; 3 cyl., 18 and 25 H.P.; 4 cyl., 30 and 40 H.P.; 6 cyl., 50 and 75 H.P.

Before Starting Out Send for Frisbie Literature

It shows the full line of gasoline motors. Also ask about the Frisbie Kerosene Motor. Burns kerosene or gasoline or any mixture. No carbon troubles, no odor. Lubrication, excellent. A guaranteed success. One ran the entire Frisbie factory for two years! We have shipped these clear to China!

Gaines' "Ruth G," 30' x 7' x 30", powered with a 2-cylinder Frisbie Motor.

The Frisbie Motor Co.
7 College St.,
Middletown, Conn.

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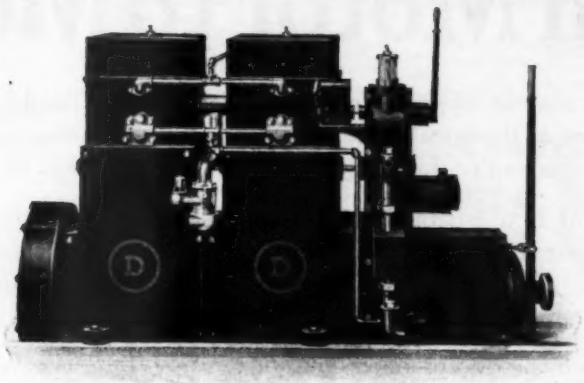
THE JOHNSON MARINE REVERSE GEAR

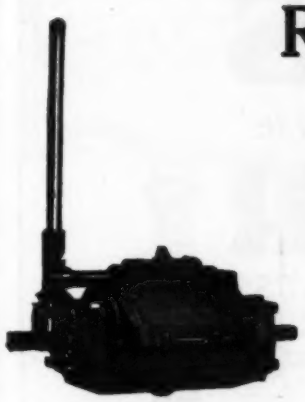
In the No. 3 Model "F" Ball Bearing Type

in a special case design, as adopted on the new

Delaware Marine Motor

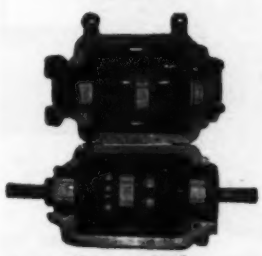


The Johnson is the Only Ball Bearing Reverse Gear Made



Exterior.

Interior.



Cover raised.

The use of ball bearings is an exclusive feature found only in the Johnson Marine Reverse Gear. And because of this feature it is selected by the majority of boat owners and engine builders.

Still another distinctive feature found in our product is the Johnson Friction Clutch which transmits the power. Many of the machines used in the larger manufacturing plants are equipped with this trouble-proof Clutch.

Nothing but the finest of material is used in the making of the Johnson Marine Reverse Gear and this is one of the reasons it is selected by such reliable builders as Evinrude, Frisbie, Koban, Lockwood-Ash and Sears Roebuck Company.

Make Your Boat Safe

You must have a good reverse gear if you want to keep the element of safety in boating as high as possible. If you will send us the size of your boat and engine we will suggest the proper gear for your use. Write to-day to department 25.

LIST OF AGENTS

1. England: The Efandem Co., 22 Newman St., Oxford St., London, W.1, Sole Agents for British Isles.
2. Scandinavia: Wilh. Sonesson & Co., Malmo, Sweden, and Copenhagen, Denmark.
3. Australia: Edwin Wood, Pty., Ltd., 231 Elizabeth St., Melbourne, Victoria.
4. France: Glaenzer & Perreaud, 18 Faubourg du Temple, Paris.
5. Canada: Williams & Wilson, Ltd., 320 St. James St., Montreal.
6. Japan: Andrews & George Co., 16 Takegawacho, Kyobashiku, Tokyo.
7. New Zealand: Ross & Co., Auckland.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

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No Engine is Better than its Rods

WISCONSIN'S Connecting rods are of the I-beam section type, drop-forged of 35% carbon steel and fitted with babbitt lined bronze bushings on the crank shaft end and bronze bushings on the wrist pin end.

Naturally It Costs More —Here's Why

The WISCONSIN Engine leaves our factory **finished**—every moving part adjusted—every bearing run in—every cylinder ground accurately to size and every journal fitted perfectly. The WISCONSIN Engine reaches the boat maker ready to install. And it reaches the boat owner ready to carry him one mile or a hundred, running cool, sweet and quiet.

Wisconsin
CONSISTENT

Engines cost less in the end.

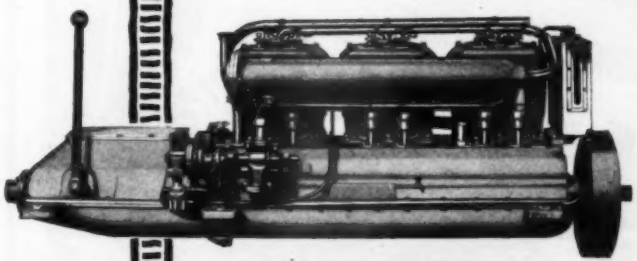
DEALERS: Consider this when you are thinking about the expensive "service" costs.

BOAT MAKERS: Compare the WISCONSIN'S slightly higher cost with the time of highly-paid men who frequently spend two or three days in your plant trying to make a lower-priced engine run properly.

BOAT OWNERS: Remember you can't walk to a farm house and telephone for a tow when your engine balks far from shore. Isn't an engine that **you can depend on** worth a slightly higher price?

Metal costs every engine builder about the same but it's the workmanship on a WISCONSIN that counts.

Write for details.



Wisconsin Motor Mfg. Co.
Station A, Dept. 302, Milwaukee, Wis.

Distributors:
New York Branch: T. M. Fenner, 21 Park Row, Factory Rep.

Marine Equipment & Supply Co., 610 Arch St., Philadelphia, Pa.

Pacific Coast Distributer: Earl P. Cooper Co., 1310 So. Los Angeles St., Los Angeles, Calif.

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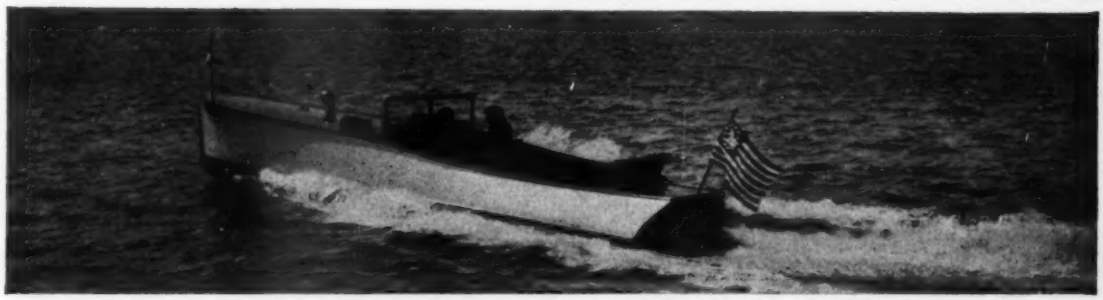
Solid Comfort

With a Fay & Bowen engine

This man has bought four. The last was a 45 H.P. for his 40 ft. cruiser.

"The best advertisement is a satisfied customer."
(That's "old stuff," but it's true.)



Some think it an advantage to buy both boat and engine from the same manufacturer. We always have on hand a few Fay & Bowen runabouts, completely equipped and powered with Fay & Bowen engines.

Send for catalog and bulletins

FAY & BOWEN ENGINE COMPANY

104 Lake Street, Geneva, N. Y., U. S. A.

NEW YORK: 50 Church St., on Concourse, Sutter Bros., Representatives
PHILADELPHIA: 610 Arch St., Marine Equipment & Supply Co., Representatives
BOSTON: 111 Haverhill St., Louis T. Carey, Representative
Built for Canada by ST. LAWRENCE ENGINE CO., LTD., BROCKVILLE, ONT.

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